BRITISH SPORTING BIRDS

F. B. KIRKMAN AND HORACE G. HUTCHINSON

ROWANBRAE,
FORFAR.

BRITISH SPORTING BIRDS

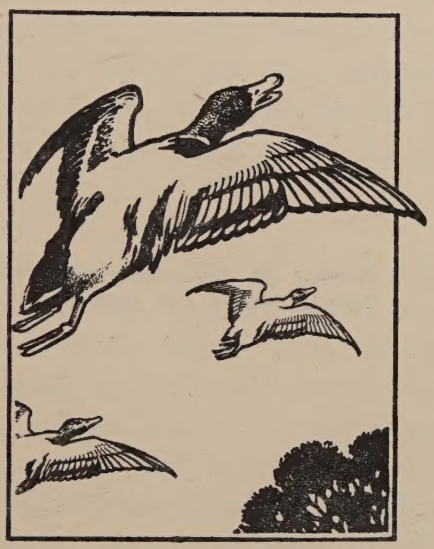
Pheasants; cock and two hens
By A. W. Seaby

BRITISH SPORTING BIRDS

EDITED BY

F. B. KIRKMAN AND HORACE G. HUTCHINSON

THE CHAPTERS ON THE NATURAL HISTORY OF EACH BIRD AND THE PLATES ILLUSTRATING THE BOOK DRAWN FROM THE BRITISH BIRD BOOK



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PREFACE

This volume is designed as a guide to the natural history and the sporting value of the main British game birds.

The Publishers believe that *British Sporting Birds* will be an invaluable manual for the Sportsman in these islands, not only because of the expert guidance provided in the sporting chapters, but because of the information in those on the natural history of the species. It is a book which is essential to the library of all country dwellers and lovers of wild nature. The chapters on Shooting are designed to give the most practical assistance, both to those who are accustomed to sport on a large scale, and to those who can enjoy only an occasional day with the gun.

The book contains :—

1. Chapters on the natural history of each bird, taken from *The British Bird Book,* now recognized as a standard work on British ornithology. These chapters, edited by Mr. F. B. Kirkman, B.A. (Oxon.), the editor of *The British Bird Book,* contain full descriptions of each bird, an account of its distribution, migration, and habits, and full information on nests and eggs. The contributors are Mr. W. P. Pycraft, Assistant in charge of the Osteological Collections at the British Museum ; the Rev. F. C. R. Jourdain, M.A., author of *Eggs of European Birds* ; Mr. William Farren ; and Mr. A. L. Thomson, M.A., D.Sc.

2. Chapters on Sport, edited by Mr. Horace G. Hutchinson, the well-known sportsman, author of *Shooting* and many works on golf and cricket. The contributors are the Hon. Douglas Cairns, Mr. Max Baker, Mr. W. J. Malden, Mr. John H. Wyatt, and Major Hugh B. C. Pollard.

3. The birds dealt with are the Ducks, Geese, Swans, Grouse (including the Ptarmigan), the Pheasant, the Partridge, the Pigeons, Plovers, the Curlew, the Woodcock, and Snipes. The Coloured Plates, 31 in all, are by such well-known artists as A. W. Seaby, G. E. Lodge, H. Grönvold, G. E. Collins, and Miss Winifred Austen ; the photographs of Nests and Eggs have been carefully selected from collections made by F. B. Kirkman, W. Farren, J. C. Crowley, Howard Bentham, F. E. Daniel, E. A. Wallis, Riley Fortune, R. B. Lodge, A. M. Stewart, C. W. Colthrup, and F. Heatherley.

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I

PHEASANT AND PARTRIDGE SHOOTING

By Horace G. Hutchinson

Pheasants, partridges, quail, three game birds of England, are the subjects of this chapter. And of these three, one, the last, the quail, may be written off because of its modern rarity in England. I regret to say that it is more than fifty years ago that I "commenced gunner," and in all that while, shooting up and down the kingdom, only twice have I seen quail, and in places so far apart as Scottish Forfarshire and the Test Valley, in Hampshire.

1. THE PHEASANT

Of shooting partridges and pheasants, to name first the better bird from the point of view of most shooters, the difference is that the partridge is always a good bird to shoot; you could scarcely make a bad bird, an uninteresting quarry, of him even if you were to try. About the pheasant, on the contrary, you have to study hard if you would make a good bird of him—that is to say if you are shooting in a flat country. If it is hill country, and the coverts are of the kind called "hanging coverts," on the sides of the hills, it is certainly your own fault if you do not make a good bird of him. And it is your own fault, or that of your predecessors, in a hill country, if your coverts are not of this kind—that is to say, planted on the hillsides—hanging coverts. Out of such coverts as these it is easy to drive pheasants from one hillside to the covert on the opposite; and with your guns posted in the valley between they are sure to give high, difficult, interesting shots. The coverts should not come right down into the fold of the valley, for if they do the pheasants

will run on into the bottom and up the other side—they will not fly at all; or, if at all, only at a very low altitude, and will be wretched creatures to shoot. But if your coverts do thus go down right to the low ground, the remedy is easy if they are in your own hand—cut out, fell, all the lower part of these coverts. If not in your own hand so to deal with them, something may be done by running a net across the covert, parallel with the line of the valley, at such distance up the covert as you wish your beaters to spring the birds for flight; but it is a mode far less effective than the other, for not nearly all the birds will consent to be so sprung into flight by the net. They will break back or dodge the net, or defeat your arrrangements by one means or another.

One has to assume that the pheasant is a bird to be beaten, to be driven by a line of beaters, up to and over guns stationed ahead. The sport of putting up a pheasant before the advancing gun and shooting him as he goes away is hardly recognised as sport to-day. And another fact that we have to realise about the pheasant is that he is a bird who much prefers his legs to his wings as his means of locomotion. He will, as a rule, keep to his legs as long as he can, and it is only by urging him against his natural inclinations that you can persuade him to take to wing at all. This is the trouble with him, and you will base your strategy on that assumption.

The problem, then, is to induce a bird of this natural disposition to fly high enough to give the guns good shots; and though he is thus disposed to low flight, if flight at all, he has one peculiarity of which advantage may be, and must be, taken—he has no fondness for flying in and out of the tree stems, as a woodcock, say, will so bewilderingly fly. The pheasant, if flushed at all, is much more inclined to fly upwards, till he is over the tree-tops. Then, if he comes forward, he will come over the guns at least at the height of those trees. The value of a net run along in the covert parallel with the line of waiting guns is that the pheasant cannot run through it. He rises when he comes to it, and flies to the tree-tops and comes skimming over them.

Obviously the worst possible kind of covert in or from which to "show" pheasants well is a big wood. The pheasants are apt to run in

it for ever, and never to rise at all. If they do rise, it is difficult for the guns to get a shot at them through the branches. The only way to deal effectively with a big wood for pheasant shooting is to turn it into a number of small woods by cutting wide rides or glades—cleared of trees—in it. Then, again with the aid of stopping nets, you may induce the pheasants to come in flight across the glades, and so give interesting shots.

By far the greater number of pheasants that are shot in course of the year are tame-bred, their eggs taken up from the nests and hatched under barndoor hens. After a while the young birds are put out into a wood or covert, probably near the keeper's house, where he will feed them daily till the shooting season comes. They will stay, by preference, in or about this home wood. If it is a year in which there is much mast on the beeches or many acorns on the oaks, the birds will wander far more widely in search of this wild food than in a year when it is scarce. Incidentally this wandering means that the keeper has far more trouble in keeping the birds together until the date of the big shoots.

But whatever the year be like in this respect, pheasants will always fly faster and more freely towards than away from their home wood. This is a fact that should be borne in mind in arranging for the beats and the stands of the guns. Always, when they are being driven away from their home, they have a tendency to break back, to fly out beyond the beating line and to come swerving back homewards, and these swerving birds may give very good shots to guns posted on the wings of the beating line. But if there is a doubt whether the birds will go forward and face the guns when driven away from their home, it is often the better policy not to have any forward guns at all, but to let the mass of the birds go on without frightening them.

They will not stand being driven indefinitely far from their home: if too far pressed they will inevitably break back. The aim should be to urge them forward to some covert—on higher ground, if feasible, than that surrounding it—from which experience has shown that they will fly high and well. Then, once they have been herded into this, the guns can be posted to intercept their homeward flight, and the beaters, coming

in from the far side of the covert, should advance slowly, under the command of the keeper, a step or two only at a time, so as to put the birds up as singly as possible, and not in one big bunch. Few out of a big bunch are fired at all; whereas each bird that comes singly, or as one of a small company, becomes a target.

All the best beating of pheasants is a quiet process. There should be no sound of the human voice except that of the keeper giving his occasional orders—"Keep a good line; keep your sticks going." The tapping of their sticks against the stems should be the only sound from the beaters. As they approach the line of guns the keeper is likely to call out, "Halt now, but keep your sticks tapping." The tapping is to prevent the birds from running back between the beaters. The halt is to endeavour to flush them singly rather than to frighten them all up at once. Then he will order, "A few steps forward," and so on until the line is right out of the covert.

Guns should always be posted far out, well away from the covert. Birds coming over the trees and catching sight of the waiting line of guns will rise higher, and come to the apex of their flight over the guns' heads. That is the distinctive character of the pheasant's flight—that the bird rises to an apex, as a rule, and thence comes volte-planing down. And the pheasant thus volte-planing is, according to the opinion of most shooters, and certainly according to mine, one of the most difficult shots that any bird can give.

Nor do I know of any rule that helps you much to deal with it. Rules, or hints, have been given, based mainly on the fact that you have here a bird that is descending as you shoot at it, whereas most are ascending. Perhaps we generally shoot over it, but I hardly know.

There are rules for the pheasant going overhead—"Swing your gun along the line of him, from his tail to his head and away in front of that to a distance depending on your estimate of his speed and distance: and then shoot." I have found that a very useful hint; and you may remember that you are much more likely to underrate than to over-estimate the distance that you should allow ahead of him.

Remember that, always, you are far more likely to miss him by

shooting behind than in front of him, whatever kind of shot it be; and further than that I hardly know that there is any other suggestion likely to help a man more than that which was often given by a very sage old Kentish keeper—"You want to get on terms with your bird." That is so vague that it is not easy to realise its meaning, but I think we can appreciate the meaning even if we cannot put it into words. I assume the meaning to be something like this: that we are to get a very clear sight of our bird, and to realise definitely, not vaguely, just where in the sky it is; and also its pace and distance. If we do all this, we shall not, perhaps, go very far wrong. Another sapient keeper, an East Anglian, used to say, "Look hard at your bird, and shoot quick."

That, again, is good, and easy, counsel. "Swing your gun with the bird's movement, and in some harmony with the bird's pace," is again a useful hint; but for all sakes do not so swing your gun as to bring it pointing to the peril of your neighbours. At the bird high in the air swing as far as you please; but the swinger at low birds—grouse or partridges coming over butts—is a dangerous fellow.

And that "Shoot quick," though perhaps it is not quite the counsel on which we were brought up, is good counsel, if it be accepted reasonably. For it does not mean that we are to snatch at the shots, but that we are not to dwell on the aim, not to dawdle, but to pull the trigger as soon as ever we have the gun, as we think, pointed right.

Over-carefulness, in the sense of dwelling on the aim, generally means that we shoot behind the bird. We have so waited that it has gone past the shot. We all must have seen this proved many a time in practice on a windy day, especially perhaps in grouse driving. We have seen the guns make quite good practice at the birds coming at what we liberally call "a thousand miles an hour" down the wind. Then, facing the other way, when the birds are coming labouring along against the wind "like owls," we have seen these same guns—and have not we ourselves done the same?—miss bird after bird, not killing these "owls" nearly as cleanly as they did those lightning fliers. Of course the moral is that they have been dawdling on the shots, because the birds were flying so slowly. It is for the same reason that we

have often heard our forefathers, who used to shoot partridges in the long stubbles over dogs, and occasionally put up a landrail, say that this was a bird so often missed "because he flies so slowly." There are few landrails now, nor any long stubbles.

More than once, when I have found myself shooting pheasants heinously badly, and have had an inkling in my mind that it was because I was shooting too slowly, I have said to myself, "Imagine that they are driven partridges, and shoot accordingly." So I did shoot at the next with that imagination in my mind, "as if he was a driven partridge," and generally with a result which pleased me, if not him.

I do not mean to imply that I suppose the driven partridge to come faster than the pheasant: I well know their relative speeds to be just the reverse. But to me, at least, it is more natural to shoot quickly at the driven partridge. The bird, unless you are shooting from butts or over a low fence where you can take him before he comes to it—and these are the less common modes—appears over the top of the hedge or of the belt with a rather startling suddenness; you have to take the first bird quickly, to be ready for the next; he is apt to twist upwards or sideways far more snipily than a pheasant, which generally sails straight on; and, just because he is so much smaller, he looks as if he were moving faster than a pheasant generally moves, although you know that in reality he probably is not.

For all these reasons you are not nearly so likely to fall into the crime of dawdling over the driven partridge as over the pheasant. That, at least, is my humble opinion.

I write with this becoming, if insincere, humility of my opinion, but I am not in the least apologetic about thrusting this digression on gunning into the middle of my discourse about the showing of pheasants. For this business of shooting is essentially double. It consists in the two arts of bringing the birds to the gun, or, less often, the gun to the birds, in such way that good shots may be had, and also in the correct dealing, by the gun, with the birds so brought. One might, in writing, divide the two into tight compartments. But

why? Why not a gunning interlude, as an outlying covert beaten out for pheasants makes a pleasant diversion in a day's partridge driving, or *vice versa*? A beat that brings pheasants and partridges, together or alternately, over the guns is perhaps most amusing of all; and this may fortunately happen if you are lucky enough to have a big heath, perhaps bracken-clad, or a big field of roots that give good covert, adjoining a pheasant wood of high trees.

If that be your good fortune, it is no bad plan to push the pheasants out into this big field or heath, to send your beaters round to the far side of it, to post your guns, facing away from the wood, at distance of a gunshot or more from it, and then to have the beaters drive the pheasants back towards the wood.

In bracken, heather, or thick roots pheasants do not run as freely as in the comparatively open ground that they commonly find under high trees. They will probably rise far out. They will mount in the air in order to top the trees, and the sight of the line of guns, though it will not make them break back from their homeward flight, is likely to induce them to rise higher, so that a stand thus arranged often gives very good shooting. And if a mixture of partridges comes along with the pheasants so much the better fun.

Presumably you shoot most of your coverts three times during the season—say once in November, second time over in December, and third time, for "cocks only," after the turn of the year. And in each of these shoots the beating has to be rather differently done. The first time over, the covert will be thick, the birds will not be so strong on the wing as later; they will lie closer, and will need more beaters to put them up. Second time over, you may do with fewer beaters in the line, but by this date the birds have learned to wander farther and know the geography of the covert better. It becomes more necessary to have "stops"—that is, beaters posted at points where the birds are likely to run or go low-flying out at the sides or corners of the covert.

By the time of the final shoot the coverts are very bare, the old cocks are very strong and very cunning, and it behoves you to approach

the coverts with all the delicacy of Agag, and with hushed or silent voices, to post all stops far in advance, and to send the beaters round at a long distance from the wood. Without these precautions you are apt to find that many of the gallant gentlemen are not at home, but have run out to safer quarters when they heard you coming.

2. THE PARTRIDGE

It seems a kindly dispensation that just in those parts of our island where the partridges are most rare the pheasants will fly their best and give finest sport. There are all those counties of the west where the grey partridge is not numerous and the red-legged species does not come at all. It is there that we have the pheasant coverts on the hillsides, so that the long-tailed bird gives sport more glorious than the man who knows only East Anglia can conceive. There is a certain belt, running roughly north and south, say, through the counties of Cheshire, Shropshire, Worcestershire, Hampshire, and Dorset, which is doubly favoured, for it has abundance of partridges, and hanging coverts for the showing of pheasants besides.

It was in the far west, in Devon, that I, a boy with an aged pointer, made first acquaintance with the partridge, which was a scarce bird there. Our method was to shoot them over dogs, in the roots. And since that is a county of small hillocks, where a covey went quickly out of sight, we sometimes used to have out a groom on a horse, whose business it was to establish himself on some height which gave him a good view, so that he might mark down the covey which we had put up. Acting under his direction we would be up and after them, if possible getting at them before the birds had time to run together after their flight; and if we succeeded in that, then the birds would rise singly and we might bag nearly all of them.

Another mode, and a very tedious mode in my humble judgment, is that of walking the birds up, as I have wearily done many a time in those great root fields of the Lothians and all up the East of Scotland,

where each swede or turnip seems to grow as big as a beer barrel, and the birds invariably get up just as your foot goes sliding off one of the barrel's sides. The keepers there used to say that "the birds wull na' drive"; the truth being, of course, that the people were desperately slow in grasping a new idea, and obstinately loth to depart from their ancestral custom; but even there the better way has come in at long last, and driving is becoming the mode. At its best, there surely is no better form of shooting sport. Perhaps grouse driving—? But even that is better only by reason of the more glorious surroundings —the hills, the heather. But the driven partridge is as difficult a bird to kill as any driven grouse. He requires not quite so heavy a blow of lead to stop him, but he is a quicker and more "snipey" twister.

His best, as I take it, is when he is brought to the gun high-flying over those belts of fir which, originally planted in Norfolk and Suffolk to keep the wind from tearing the light soil away from the roots, are now invaluable for putting the partridges well up into the air as they come over the tops of the trees. There the guns may stand a full gunshot back from the belt. The birds, so high up, will not, as a rule, turn back at the sight of the line of waiting guns. The first shot at the leading bird may be taken the moment it shows above the belt. There is time for another shot in front with the second barrel, and then, with a quick exchange to the second gun from your loader, you may have one, or perhaps two, more as the covey goes. That is the ideal of driving. A high fence, in the absence of the belt, may serve, but it does not put the birds so high in air; the guns cannot be posted so far back. It is seldom you can get in two shots in front. Where the hedge is low, the guns may stand up close and look over it, and so shoot the oncoming birds in front; but one does not get the same clear sight of low-flying birds as when they are up against the sky. Besides, with these low-fliers, you have always at the back of your mind—or should have—a care for the position of other guns and beaters. There are none of them up in the air.

You will enjoy a day's partridge driving a great deal better if you can mix with the pleasure of the actual shooting some interest in the

work of the drivers, for the driving is a fine art. Unfortunately, in the best possible disposition of the guns—that is, behind a belt or high hedge—it is very seldom possible for them to watch the process of the drive. From behind a butt or a low hedge something of the whole operation may be seen, but these are not the ideal positions for shooting the driven bird. Usually the commencement of the drive and the still far-off coming of the beaters are announced by a hare passing through the belt and stopping very apprehensively, its nostrils twitching as it tries to estimate the danger in front. Perhaps a clattering flock of fieldfares will pass overhead, and if the scene be East Anglia, a bunch of the queer Norfolk plover may come over. With the rather important exception that the partridges do not shoot back, the strategy of a partridge-drive is rather like that of a battle. The object of the beaters is, of course, to urge the birds over the belt, or hedge, or line of butts where are the guns. And the birds will fly most kindly in the direction desired if there is a good covert, such as roots or a fern and heather-clad heath, to which they can fly. Therefore there is more in the general strategy than the immediate object of this pushing the birds over the guns. For just as in Devon it was good to get at the covey which had once been flushed before the birds ran together again, so, too, in East Anglia. For then, as before, the birds will rise more or less singly, and nearly all may give shots to the guns. So that the one drive is not concerned only with its own results, but is also aiming to fill up your heath or root field with birds for the next drive. The planner of the drive has thus always to be looking two or three drives ahead in order to make the best of the ground and of the birds.

Nor is it only necessary to bring the beating line straight on towards the guns. As a rule, one side, or one wing, of the line will be advanced beyond the general line, because the birds are apt to drift down to leeward as the direction of least resistance. Perhaps your wing beaters may be provided with extra long flags, to try to scare the birds back if they do show this disposition to break out to the side of the line. But it is always to be remembered, in all driving, that the birds are rather to be persuaded or shepherded than scared.

If they get into a panic they are likely to fly wildly and widely, far out of the control of the beaters—very likely right off your ground.

And just as you will advance one flank of the line when the birds are apt to drift out on the leeward side, so, too, you will advance the flank on the boundary of your ground if you are driving near your neighbour's march. There is no bad sportsmanship in thus doing your best to keep your own birds to yourself.

Often there is a large space of ground lying outside the extent over which you intend the actual driving to take place; and those outlying fields you may as well drive in before the guns take their stand, so as to collect the birds from off them.

You will be driving the birds over the guns towards some such good covert as we have spoken of—it is covert which will vary in its position from year to year with the rotation of crops, and you must vary your driving plans accordingly—but it is not a good plan actually to post the guns in ground thus heavily covered, because the finding of the dead birds is so difficult. The better plan is to have the stand in a field beyond which, on the farther side from the line of the drive, lies the good covert. After being saluted all along the gunning line, the surviving birds may be fairly relied on to fly on across that field and into the next, where the covert is.

No shooting of any kind, whether of driven birds or otherwise, should be done after the birds have begun to pair; and in a mild winter this happens quite early in January. In order to have a good stock for the next year, it is necessary to leave a tolerably large stock on the ground at the end of each shooting season. In this respect partridges differ from grouse. In the opinion of some keepers and good judges it is not possible to leave too many partridges. It is very easy to leave too many grouse, for if the population is excessive in the "lean months," when their natural food of heather seeds and young shoots is scarce, they weaken and become an easy prey for the so-called "grouse disease." There is no similar risk in leaving a heavy stock of partridges.

It is only within the last twenty-five years or so that any real

study has been given to improving the stock of partridges on an estate. Before that they were generally left to themselves, to do as best they could in a happy-go-lucky way. There was no idea of helping them, as pheasants were helped. The keeper was supposed to have done his duty by them if he watched well for poachers and kept the vermin down to a reasonable figure.

More intelligent methods have come into vogue. The keeper on a well-managed partridge shoot will have an outline map of the estate, showing all the hedges, etc., and with every partridge nest marked on it. He will have a diary referring to these nests, with the date of laying of each egg, and so on. Nests in dangerous places—as, for instance, near roads or paths where they are apt to be poached—will be filled up with dummy eggs or with old hard-boiled eggs. The fresh eggs from such nests will either have been distributed into nests made in more secure places, or will have been taken home and set under small hens of the barnyard. When the young birds begin to chip the shell of these eggs they will be taken back by the keeper and replaced in the stead of the dummy eggs on which their mother has been sitting in the meanwhile, and she will then lead them off, as soon as they are ready to run, just as if she had been brooding them all the time.

Writing at this brevity about a subject so complicated as game-bird shooting, it is inevitable that some of its many aspects must go without any notice at all. A whole long chapter would be needed to discuss at all adequately the craft of vermin-killing and the science of distinguishing between the real foes of the game birds and those which are not hostile, but possibly are active friends disguised in suspicious fur or plumage. The very rendering of the sitting partridge immune from the roving fox alone might be discussed at length. The supply of grit for the birds in its natural absence, of water in a dry season, and a score more of plans for their better faring ought to come into the review were there space.

But space is short and the whole art of shooting is long; and, after all, it is better learnt in the field than in the study.

There is one human side of the subject on which I would say one final word: Keep on good terms with the farmers and the labourers. Their goodwill may be secured at an easy rate—an occasional brace of pheasants for the farmer, a rabbit or two for the labourer. At such moderate outlay you may purchase their friendliness, which will be repaid with interest. A farm labourer who is your friend is also something like an under-keeper. He will be an anti-poacher and a vermin-killer on occasion. He will tell the professional keeper of any outlying nests. If, conversely, he is your enemy, a single step of his heavy foot on one of those nests destroys a whole covey; and even if he is detected he will plead that it was accidental, and you cannot disprove it.

II

THE NATURAL HISTORY OF THE PHEASANT, THE PARTRIDGES, AND THE QUAIL

PRELIMINARY CLASSIFIED NOTES

[F. C. R. JOURDAIN. W. P. PYCRAFT. A. L. THOMSON]

PHEASANT [*Phasiánus cólchicus cólchicus* Linnæus; and *P. cólchicus torquátus* (Gmelin).[1] French, *faisan*; German, *Edelfasan*; Italian, *fagiano*].

1. Description.—The pheasant is readily distinguished from all other British game-birds by the long, wedge-shaped, pointed, black-barred tail, and the large size of the face-wattles. The sexes differ conspicuously, and there is no seasonal change of plumage. (Pl. 1.) Length 35 in. [889 mm.]. In the male the crown is of a bronze-green, the rest of the head and neck dark green, with purple reflections. The scapulars, interscapulars, and all the under parts save the abdomen are of a golden orange colour. The feathers of the mantle (scapulars and interscapulars) are marked with concentric bands of buff, black, and orange-red, and tipped with purple-lake. The feathers of the fore-neck and breast are notched at the tip, and have terminal black margins. The lower back, rump feathers, and upper tail-coverts are red-maroon, glossed with purplish lake or oil-green, according to the incidence of the light. The mid-breast is of a dark purplish green. The tail feathers have an olive-brown tinge, and are barred with narrow, wide-set black bars, edged with rufous. The sides of the head bear large bare erectile face-wattles, covered with small fleshy, vermilion-red papillæ, and a further ornamental feature is produced by short erectile feather-tufts or "horns." The beak is white, and the legs are armed with spurs. The female has a much shorter tail, and is of a sandy brown, barred with black; the back and sides of the neck have a pinkish tinge and metallic purple or green margins; the mantle, sides of the breast and flanks are chestnut, with black centres and pinkish grey margins. The tail feathers are of a reddish brown,

[1] Practically all our British pheasants are mongrels, owing to the introduction of many different forms which have interbred, until the true *P. colchicus colchicus* has disappeared

shading into sandy olive at the sides, and barred with buff and black. The juvenile plumage resembles that of the female, but differs in its duller hues, the upper parts being of a dull black relieved by loops of buff formed by the margins of the feathers. The under parts are of a pale buff, more or less conspicuously barred on the fore-neck with dull black. The vinous and chestnut tints of the adult female are wanting. The downy young has a patch of pale chestnut on the crown enclosed within a more or less distinct loop of greyish black, the free ends of the loop turned backwards. A patch of black marks the aperture of the ear, and is continued back as a short wavy line to the nape. The back is of a pale chestnut with a median band of dark chocolate on each side. The rest of the plumage is pale buff. The area of the future face-wattle is demarcated by a narrow line of bare skin. Pure-bred birds of this species are now almost, if not quite, extinct in these islands, and this owing to the introduction of, and interbreeding with, three other species, two of which are characterised by the presence of a white ring round the neck. The salient features of the males of these three species are as follows:—*P. c. torquatus*, with the lower back, rump, and upper tail-coverts bluish slate colour, and a rust-coloured patch on each side. *P. c. mongolicus*, with a very broad white ring, interrupted in front, white wing-coverts, and the lower back, rump, and upper tail-coverts maroon or reddish bronze. *P. c. versicolor*, differing from *P. c. torquatus* in having no white ring and the whole of the under parts dark green; and the mantle dark green shot with purple, each feather marked with concentric lines of buff. [W. P. P.]

2. Distribution.—The pheasant has been naturalised in England from a period before the Norman invasion, and, according to tradition, it is to the Romans that we owe its presence among us. It is found in a semi-wild condition in nearly every part of England, and locally in Wales; but in Scotland, though artificially reared in many places, it seems only to thrive in a wild state in Perth, Forfar, Wigtown, Aberdeen, and Moray, though it has been introduced even to the Outer Hebrides. In Ireland it breeds in every county. Its original home seems to have been Asia Minor and Transcaucasia, but it has been wild for centuries in Corsica, and the Balkan Peninsula is probably within its natural range, while it has been introduced into nearly every European country as well as into America. In modern times so many forms have been turned down, in order to introduce fresh blood, that the old race has died out almost altogether. *P. colchicus torquatus*, of which most of our birds now show traces, is a Chinese race, inhabiting Central and South China, and was introduced early in the nineteenth century. Of late years *P. c.*

versicolor (from Japan) and *P. c. mongolicus* (from Mongolia) have been largely imported, and have bred freely with our native stock. [F. C. R. J.]

3. Migration.—This long naturalised but often semi-domesticated bird is resident and stationary. [A. L. T.]

4. Nest and Eggs.—The ordinary nesting-place is a shallow depression in the ground scratched out by the hen in a wood or hedgerow, or under shelter of bushes and rank vegetation. Many instances have been recorded at different times in which this species has nested in trees, sometimes in old squirrel's dreys, or nests of wood-pigeon, sparrow-hawk, longeared-owl, or other bird, and frequently eggs are found in the nests of other species, such as wild duck, shoveler, partridge, and even woodcock. There is a scanty lining of dry grass, dead leaves, etc., brought together by the hen. (Pl. II.) The eggs are 8 to 14 in number, but as many as 22 may be found in a nest, probably the produce of more than one hen. Normally they are uniform olive-brown in colour, varying to some extent in depth of tone, but pale blue eggs are also occasionally met with, though usually regarded by breeders as a sign of degeneracy. Average size of 35 eggs, 1·81 × 1·41 in. [45·9 × 36·0 mm.]. As a rule incubation is performed by the hen alone, although several instances of males incubating have been recorded. The incubation period is about 23 to 24 days. In the south of England the first eggs are picked up at the beginning of April, but not till the latter part of that month in the north, and from that time onward through May and June, though only a single brood is reared in the season. [F. C. R. J.]

5. Food.—Grain, seeds, fruits, berries, acorns, beech-mast, roots, spangles of oaks containing eggs of the gall-fly, caterpillars and other insects, slugs, earthworms, vipers, mice. The young feed on insects, ants' "eggs" and larvæ, and are accompanied in their search for food by the female. [W. P. P.]

PARTRIDGE

[*Pérdix pérdix* (Linnæus); *Pérdix cinérea* Latham. Paitrick or paitrich (S. Scotland). French, *perdrix grise*; German, *Rebhuhn*; Italian, *starna*].

1. Description.—The common-partridge is to be distinguished at all ages by having the tail composed of eighteen feathers of nearly equal length. There are slight seasonal changes of plumage, and the sexes differ slightly in coloration. (Pl. IV.) Length 12·5 in. [317·5 mm.]. The adult male is of a brownish buff colour above, with narrow, close-set wavy cross-bars of black, while the scapulars, lesser and

median wing-coverts, are blotched on their inner webs with chestnut; further, the wing-coverts have a conspicuous longitudinal buff shaft-streak. From September to June the top of the head is brown narrowly striated with buff, the rest of the head and throat being of a bright rust-red. The breast and flanks are pale grey, finely mottled with black, and barred, on the flanks, with chestnut, while a large horseshoe-shaped patch of chestnut marks the centre of the breast. The rest of the under parts are whitish. The first flight feather is rounded at the tip. A small area of red skin surrounds the eye, the beak is of a blush-brown colour, the legs pale bluish grey, and the iris brown. In May this plumage is much faded, the chestnut colour almost disappearing. From June to September the male assumes a partial "eclipse" plumage, affecting only the head and neck. Herein the striations on the crown are conspicuous by their absence, while the neck is brown, with buff striations narrowly bordered with black. The rust-coloured area of the throat fades to pale rufous. Birds in this plumage in the autumn are sometimes mistaken for "forward" young birds, but may be distinguished therefrom by the rounded tip of the first primary. The female is to be distinguished by the brown hue of the head and neck, which are conspicuously striated with buff, and by the coloration of the lesser and median wing-coverts which are black, with wide-set somewhat wavy buff crossbars, in addition to the longitudinal shaft-streaks of buff. The chestnut horse-shoe is smaller than in the male, or may be wanting. Like the male, the female assumes a partial breeding ("eclipse") dress in May, the feathers of the crown of the head and neck, and the forepart of the interscapular region being more or less completely replaced by black and buff marked feathers with a longitudinal buff shaft-streak, and subterminal buff spot. These feathers are retained till September. In the juvenile dress the general coloration is of a brownish buff striated on the mantle, fore-neck, and breast with pale buff longitudinal, black-edged shaft-streaks. The wing-coverts and scapulars are black with buff crossbars and shaft-streaks, recalling those of the adult female. By October young birds resemble the adults, but may be distinguished by the pointed first primary. The young in down is of a greyish buff. The crown dark chestnut, the sides of the head yellowish, with a long loop of black, the ends of which are turned forwards. Down the back of the neck runs a black stripe, dividing at its base to run down on either side of the middle of the back; below this dorsal stripe runs a similar line which, at its hinder extremity, turns forward to form a short loop. Two striking variations of the common-partridge occasionally occur—a red and a grey. The red variety was at one time regarded as a distinct species, known as the mountain-partridge

(*Perdix montana*), or as the Cheshire-partridge. Herein the head and neck are of a bright rufous buff, and the rest of the plumage rich chestnut, some of the feathers of the upper surface, especially the wing-coverts, being usually more or less vermiculated with pale greyish or yellowish white and black. The quills are washed with the same chestnut tint. The sexes of this variety are indistinguishable. Every intermediate stage between the most typical red forms and normal examples of *P. perdix* is to be met with; and examples have been procured in almost every county in England and Scotland. In the grey variety the forehead, superciliary stripe, chin, and throat are whitish, washed with very pale rufous, and the general colour of the rest of the plumage is clear grey, vermiculated with black. The horse-shoe patch on the breast is pale greyish brown, or pale chestnut colour. White and Isabelline varieties also occur, but are of less interest (W. R. Ogilvie-Grant *in litt.*). [W. P. P.]

2. Distribution.—In England the grey-partridge is widely distributed, but has greatly diminished in numbers of late years in many districts, though still very numerous in the light sandy soils of East Anglia and some of our southern counties. It occurs in Anglesey and in Wales up to about 1200 feet, but is local in Scotland and confined to the straths and lowlands, avoiding the mountain ranges and moorlands. It is absent from the Outer Hebrides, and has only been introduced successfully to a few of the Inner Hebrides, while attempts to naturalise it in the Orkneys have proved failures. It breeds in every Irish county, but is not numerous, and tends to become scarcer. Outside the British Isles it is resident in Southern Sweden, and in Russia ranges to 66° in Finland, 64° in the Archangel government, and 58½° in the Urals. From these limits it is fairly general in the countries of the European plain, but in the Pyrenees and Northern Spain is replaced by a closely allied race. Eastward it ranges to North Italy, the Balkan Peninsula south to Thessaly, and South Russia. In Asia it is found in parts of Asia Minor, the Persian highlands, and Siberia to the foot of the Altai range, but farther east it is replaced by other forms. Although sedentary in the British Isles, it is subject to migratory movements on the Continent, especially in South-eastern Europe. [F. C. R. J.]

3. Migration.—Resident, but not altogether stationary although there is no evidence of any regular British movements. Coveys have been seen to cross the Solway Firth "from the slopes of the Dumfriesshire hills to the well-cultivated lands of the Cumbrian plain" (cf. Macpherson, *The Partridge*, 1893, p. 8). There are also records of birds which have apparently crossed the English Channel, but probably accidentally (cf. Ticehurst, *B. of Kent*, 1909, p. 387), and of examples

obtained at the Irish light-stations (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 233). The species has also occurred on Heligoland (cf. Gätke, *Vogelwarte Helgoland*, Eng. trans., 1895, p. 443), but it is altogether more decidedly migratory on the Continent. [A. L. T.]

4. Nest and Eggs.—The nest is placed in a depression scratched out by the hen, in a hedgerow, under shelter of a bush, or among grass on a bankside, as a rule; but occasionally it breeds on stacks, and has been found nesting in ivy twelve feet from the ground. The only lining to the nest consists of a little dead grass and dead leaves, with which the eggs are covered during the absence of the hen. (Pl. II.) The eggs, as a rule, range from 10 or 12 to 20 or so in number, but at times large clutches of 30 to 40 eggs are met with, which are due to more than one hen laying in the same nest. In colour they vary from olive-brown to greyish olive, but occasionally blue eggs, or eggs with a blue band, are found. It is not uncommon to find partridge's eggs in the same nest as those of other species, such as the red-legged-partridge, pheasant, etc. Average size of 90 eggs, 1·38×1·05 in. [35·2× 26·8 mm.]. Incubation is carried on by the hen alone, the cock keeping guard close at hand, and as a rule lasts for 24 days (Evans and Heinroth), some eggs not hatching till the 25th day: Saunders, however, gives the period as 21 to 23 days. As a rule the first eggs are not laid till late in April, but there are a few records of full clutches early in the month, though the average date when incubation begins is the middle of May for England, and a week or two later in the north. Only one brood is reared in the season, but if the first clutch is destroyed, the second laying may be delayed for a month or so, and eggs have been seen in September and October. [F. C. R. J.]

5. Food.—The young shoots and leaves of grass and clover form the staple diet; but the tender shoots of heather, bramble, and blaeberry are also eaten when they are to be had. In the summer spiders, grasshoppers, beetles, ants, flies, the pupæ of the crane-fly, and aphides are greedily eaten. The young feed on insects and their larvæ, and are accompanied in their search for food by both parents. [W. P. P.]

REDLEGGED-PARTRIDGE [*Cáccabis rúfa* (Linnæus). French partridge, Frenchman, red-leg. French, *perdrix rouge*; German, *Rothuhn*; Italian, *pernice*].

1. Description.—The adult redlegged-partridge may at once be distinguished by the pale grey flanks which are conspicuously barred with black, white, chestnut-

Photo by F. B. Kirkman

Partridge nest with eggs covered

Photo by F. B. Kirkman

The same with covering removed to show eggs

Photo by F. B. Kirkman

Pheasant on her nest

Photo by W. Farren

Red-legged partridge's nest and eggs

red. The sexes are alike, and there is no seasonal change of coloration. (Pl. III.) Length 13·5 in. [331·46 mm.]. The crown is grey, bounded on either side by a conspicuous white superciliary stripe. A black band runs from the base of the beak to the eye, and thence backwards and downwards to form the boundary of a white throat. The whole of the upper parts, save the crown, are of an earth-brown colour. The fore-neck and fore-breast are rufous spotted with black; the breast and flanks are pale lavender-grey, the latter barred with chestnut-red, black, and white, while the rest of the under parts are of a rich buff. The bare skin round the eye, the beak, and legs are of a bright coral-red. In the male the legs are armed with one or two pairs of blunt, tumid knobs or spurs. The juvenile plumage differs conspicuously from that of the adult, and bears no resemblance to that of the common-partridge of the same age, striations being conspicuous by their absence. The interscapulars are of a uniform dark, greyish brown, the scapulars greyish brown with a subterminal bar of black, and a spot of white at the tip of the shaft. The head and neck are of a dirty buff colour, the fore-breast greyish brown, with a white spot at the tip of each feather. Tail feathers brown mottled with black. The downy nestling may at once be distinguished by the pale chestnut colour of the crown, and the presence of a median and two lateral longitudinal stripes of dull buff, on a background of chestnut mottled with black. [W. P. P.]

2. Distribution.—This is an introduced species in the British Isles, and was first acclimatised in England about 1770 in Suffolk. Since then it has increased its range considerably, and is now common in East Anglia and the counties of the English plain, penetrating to the Welsh coast on the west side, and the counties bordering the Channel on the south, but only a straggler to the Devonian Peninsula. Northward it is local in Yorkshire, Derbyshire, and Staffordshire, and has failed to establish itself farther north, but has recently been introduced in Elgin. On the Continent it is scarce in Northern France, and very rare in Belgium except in the hills. In Switzerland it occurs in the Jura and Wallis, and is common from Central and Southern France south to Andalucia, but the Spanish race, as well as those from Corsica and Madeira, have been separated subspecifically. Its presence on the Azores and Canaries is perhaps due to introduction, but it occurs in the Balearic Isles, and also in parts of North-west Italy. [F. C. R. J.]

3. Migration.—The introduced stock is resident and stationary; but there is some evidence of a slight cross-Channel immigration to the south-east of England (cf. Ticehurst, *B. of Kent*, 1909, p. 388). [A. L. T.]

4. Nest and Eggs.—Like its relative, this species scratches out a hollow

in a hedgerow or under shelter of a bush, often on the top of a bank, and lines it carelessly with a little grass or a few dead leaves. A good many nests have been recorded on the tops of stacks of straw, oats, etc. Apparently the nest is the work of the hen alone. (Pl. II.) In it she lays, as a rule, about 10 or 12 to 18 eggs, occasionally as many as 20, which vary in ground-colour from yellowish or buff to a warm rufous tint, speckled with fine red-brown spots and a few irregular blotches of purplish or reddish brown. Average size of 53 eggs, 1·59 × 1·21 in. [40·5 × 30·8 mm.]. Incubation is performed by the hen alone, and, according to Mr. W. Evans's experiments, lasts 23 to 24 days. The laying season begins slightly earlier than that of the grey-partridge, the first eggs being laid in the south of England during the latter part of April, sometimes not till May, and a week or two later in the north Midlands. Only one brood is reared during the season. [F. C. R. J.]

5. Food.—As common-partridge. [W. P. P.]

QUAIL [*Cotúrnix cotúrnix* (Linnæus); *Cotúrnix commúnis* Bonnaterre. Wet-my-lip, wet-my-feet, but-for-but (Cheshire). French, *caille*; German, *Wachtel*; Italian, *guaglia*].

1. Description.—The common-quail may readily be distinguished by its small size, sandy coloration, and the median buff longitudinal stripe on the crown. (Pl. V.) Length 7 in. [177·80 mm.]. There is no seasonal change of plumage, and the sexes slightly differ in coloration. In the male the feathers of the crown and nape are black, tipped with pale brown, and down the centre of crown runs a band of buff, and there is a similarly coloured superciliary stripe. The interscapulars are black with irregular transverse bars of pale brown, and dull white shaft-streaks; the hindmost feathers have their tips powdered with grey; the scapulars are pale brown with lanceolate, dull white, black-bordered shaft-streaks, and barred and blotched with black and buff. The wing-coverts are pale brown, with buff shaft-streaks and transverse bars, while the quills are brownish grey having the outer webs transversely barred buff. The tail feathers are dusky, with buff shaft-streaks and transverse bars, their coverts black, with shaft-streaks and transverse bars of buff. There is a black malar stripe, and the throat is white marked with a black, inverted anchor, variable in size. The fore-breast is of a pale chestnut with buff striations; the flanks greyish brown, with black-margined buff striations and black bars and blotches on the outer webs; the abdomen is pale buff. The female differs from the male in having the black of the upper parts duller. The throat is

of a pale uniform buff, lacking the black anchor. The rest of the under parts are of a similar buff hue, tinged on the flanks with rufous; the flank feathers further have buff shaft-streaks and marginal black spots. In the juvenile fledgling plumage the upper parts are heavily striated with dull white, and barred with black on a buff ground. The fore-breast and flanks are of a pale buff, with very narrow, hairlike, white shaft-streaks, and a pair of subterminal black spots on each web. The young in down is buff-coloured, tinged with rufous on the crown and lower back, which are relieved, as to the crown, with two black longitudinal stripes, and as to the back with a median and lateral black stripe. [W. P. P.]

2. Distribution.—Formerly this species was much more plentiful as a summer resident than it is at the present time in the British Isles, partly owing to changes in the country and partly to destruction at migration periods. It haunts rough pastures as well as cultivated land, and is now chiefly met with in the southern counties of England and the eastern half of Ireland. At intervals it has appeared in greater numbers than usual, but on the whole the tendency is steadily to diminish. Although it becomes scarcer in the north, it has been recorded as breeding on the Orkneys, Shetlands, Fair Island, and the Outer Hebrides, and was formerly abundant and widely distributed in Ireland. Outside the British Isles it has bred in the Færoes, and on the Continent it is found on the low ground in Norway up to Trondhjemsfjord, and in South Sweden regularly, up to lat. 65° in Finland, and to the White Sea and lat. 60½° in the Urals. From these limits southward it is found throughout the Continent in suitable districts south to the Mediterranean and Black Seas. It also breeds in the islands of the Mediterranean as well as in North Africa, but the form which occurs on the Atlantic isles (Azores, Canaries, Madeira, etc.) is apparently that which inhabits Central and Southern Africa. In Asia it is found in W. Siberia, north to lat. 61° on the Yenisei, and east to Lake Baikal, as well as in South-west Asia (Asia Minor, Persia, Afghanistan, and occasionally even in India), but in Eastern Asia and Japan it is represented by an allied form. The winter range extends in some cases to the Cape, Madagascar, and Mauritius, as well as to the shores of the Indian Ocean, but many birds winter in the Mediterranean region, and exceptionally even in the British Isles. [F. C. R. J.]

3. Migration.—Chiefly a summer visitor in very variable numbers, and with a rather variable and local breeding distribution. Some frequently remain in parts of our area during the winter; and there may possibly be a slight passage to and from countries farther north. Up till the middle of last century the quail was abundant and partially resident in Ireland, but since then its numbers have

undoubtedly diminished (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 234). But both in Ireland and Great Britain the stock is temporarily increased by occasional exceptionally great spring immigrations: the seasons 1870, 1885, 1892, and 1893 may be specially mentioned (cf. Saunders, *Ill. Man. B. B.*, 2nd ed., 1899, p. 505; and Forrest, *Fauna of N. Wales*, 1907, p. 314). The spring immigrants arrive about the second week of May (cf. Ticehurst, *B. of Kent*, 1909, p. 391), and the majority leave in or before October. A gregarious and at least partially nocturnal migrant: flocks of immense size occur in the Mediterranean countries, especially in spring, and, "as of old in Sinai, multitudes come up in the night and cover the land" (Saunders, *loc. cit.*). [A. L. T.]

4. Nest and Eggs.—The nest hollow is scratched out by the hen among growing crops or grass, often among clover or lucerne, and is lined with grasses and stalks. The eggs vary a good deal in appearance, but have generally a yellowish white or stone-coloured ground. Sometimes the markings consist of innumerable small umber-brown spots; at other times there are a few blotches of deep sepia, and some eggs have the ground almost hidden by numerous large blotches of rich blackish brown. As a rule they range in number from 7 to 12 or 14, but clutches of 15 and 16 have been recorded, and Leverkühn mentions a nest of 26 eggs, probably laid by two birds. Average size of 50 eggs, 1·14×·88 in. [29·1×22·4 mm.]. Incubation is performed by the hen alone, and is stated by several authorities to last for about three weeks, though Thienemann gives 18 to 20 days. It is, however, worth noting that other species of this genus, whose incubation period has been accurately observed in captivity, hatched out in 16 to 18 or 19 days, the male deserting the female as soon as incubation had begun and seeking another mate. In England the eggs are not laid till late in May, the full clutch often being not completed till mid-June, while in Scotland they may be found in July, and exceptionally even in September (Saxby). Saunders states that two broods are sometimes reared in the season, and partly fledged young have been met with in Yorkshire in September. Possibly the second broods may be reared by birds which have wintered with us, and reared their first hatch early in the season. [F. C. R. J.]

5. Food.—As the common-partridge. [W. P. P.]

1. THE PHEASANT

[W. P. Pycraft]

The pheasant such as most of us are familiar with to-day is like the "American"—a mixture of many types. The true "American," claiming descent from the Pilgrim Fathers, has been swamped by a medley of races from many lands. Similarly, *the* pheasant (*Phasianus colchicus*) has lost its identity, so far as these islands are concerned, by the introduction of alien species which, interbreeding with the ancient stock, have transformed it beyond all recognition. It is not within the scope of the present work to trace out in detail how this process of transformation has taken place, or to describe minutely the various species which, from time to time, have been "turned down" into our coverts, for these, at any rate, are *not* British birds. It is a moot point, indeed, whether even *the* pheasant, *Phasianus colchicus*, is entitled to this rank. According to some, this bird was introduced with many other excellent things by the Romans. Others aver that it is an indigenous species, and this because fossil remains of a pheasant have been found not only as far south as Greece, but also as far west as France. Now, as Great Britain so late as Pleistocene times formed a part of the mainland of Europe, it is quite possible that this bird may have accompanied the elephant, rhinoceros, cave-bears and lions, and many other species long since extinct not only on our soil but in Europe. But be this as it may, even if introduced by the Romans we may fairly claim for it the rank of a British bird; indeed many of its most zealous guardians are satisfied, in claiming British nationality, with a pedigree which goes no farther back than 1066: few of us can do even this. From the remotest periods of our history the pheasant has been regarded with singular favour, and rightly so: the strong arm of the law has always guarded its safety. In Saxon times even a limit was put on the number which might be slain.

During these early days, however, the pheasant must have been a comparatively rare bird, and hence the care expended on its preservation. Its capture was possible only by snares, nets, the cross-bow, and by hawking. The introduction of firearms gradually, and materially, changed the conditions of existence, and, incidentally, has done much to rob us of many of our finest and most interesting birds. Greater facilities of killing has slowly bred what it is no exaggeration to call a lust for killing, which overrides all other considerations. To ensure huge "bags" the noble falcons, eagles, buzzards, hawks, owls, jays, and magpies have been, and are, ruthlessly slaughtered—branded with the odious name of "vermin." The generous instinct of the "sportsman" has become poisoned by the overmastering desire to make record bags. Hundreds of thousands of birds are now reared annually, under artificial conditions—hatched under domestic hens, and in incubators—to be turned adrift at a fitting time to make "sport." Most emphatically we agree with the protection of this most valuable bird, but we cannot suppress a regret, that at times becomes indignant, that it should have been considered necessary to press protection to such inordinate lengths.

There is a general impression abroad that the pheasant of the English coverts of to-day is a semi-domesticated bird, that the killing thereof is much on a par with shooting barn-door fowls! This is not the experience of those who rear and shoot them. In spite of the purple period of its early life the pheasant remains unspoiled; retaining all the ancestral love of seclusion, and dislike of the haunts and ways of men; wherein it agrees with its congeners the Grouse and Partridges.

In the selection of its haunts, as in its physical characters, it differs conspicuously both from the Grouse on the one hand and the Partridges on the other. As regards its physical characters, one of its most striking peculiarities, as compared with the types just mentioned, is afforded by the covering and armature of the feet, or, as many would say with less accuracy, of the "legs." In the first place these,

unlike those of the Grouse, are ensheathed in symmetrically disposed horny plates, and are not feather-clad. In the second, these feet, in the male at any rate, are armed with formidable spurs. Then the sides of the head are ornamented by a large featherless patch of skin, brilliant vermilion in colour, and covered by little fleshy papillæ forming a sort of velvet pile. In the Grouse tribe a similar patch of skin surmounts the eye, while in the Partridge bare skin is restricted to a small region around the eye, red in colour, but devoid of the papillæ. Finally the tail of the pheasant is of a characteristic V-shape, differing conspicuously from that of the Grouse family.

Although some no doubt would have it otherwise, it is doubtful whether the coloration of the pheasant has been in any way determined by the bird's environment. And this view need not affect what has been said in regard to the ptarmigan in this respect. Very well. Before proceeding further it will be best, perhaps, to state that in this place we propose to speak simply of "the pheasant" as though our coverts were tenanted by a single pure species, for these pages are devoted to an account of "British Birds," and it would therefore be foreign to the purposes of this work to treat of species imported since the end of the eighteenth century as though they were entitled to rank as members of our avifauna. Nevertheless, it will be necessary to say something of these birds in order that we may understand the process of transformation which has overtaken "the pheasant" as we know it to-day in these islands. To begin with, then, the parent stock of the present tenants of English coverts is, or was, "the old English pheasant," *Phasianus colchicus*, a bird which, whether indigenous to these islands or introduced by the Romans, must be regarded as an undoubtedly British bird. Pure-bred examples of this species are not now to be met with in Great Britain, and must be sought for in Southern Turkey, Greece, and Asia Minor as far east as Transcaucasia; and it extends northwards to the Volga.

The precise date of the introduction of the Chinese ringed

pheasant, *P. torquatus*, and of the Japanese pheasant, *P. versicolor*, cannot be determined, but we may reckon it from the end of the eighteenth century. The pheasant as we know it to-day is a blend of these three species, the ring-necked being the dominant element. The wild parent species of this bird ranges from the lower Amoor, Manchuria, Corea, Japan, and Eastern Mongolia through Northern and Eastern China as far south as Canton. The Japanese pheasant, *P. versicolor*, as its name implies, is confined to Japan, though not met with in Yezo. It is decidedly the smallest of the three, but is an extremely handsome bird, and hybrids between this and the Chinese pheasant are remarkable both for their great size and singular beauty.

During the last few years yet other species have been turned down, of which especial mention may be made of the Mongolian pheasant, since this may now be regarded as established among us, at any rate locally. It is a very handsome bird, and of large size. Its most striking features are the great width of the white collar, which is interrupted in front, and the large area of white in the wings, formed by the wing-coverts. The mantle and breast are of a bronzy-orange-red shot with purple-carmine and green, according to the incidence of the light, while the rump is of a deep maroon, glossed with green and purple. Little seems to be known of its habits in a wild state, and this on account of the remoteness of its haunts, which range, as Mr. Ogilvie-Grant remarks, from the valley of the Syr-Darya across the basin of Lake Balkash as far east as Lake Saisan and the valley of the Black Irtish, and southwards to the valley of the Ili and Issik Kuhl.

Inasmuch as the pheasants can be interbred with wonderful facility, and since species whose ranges overlap interbreed freely in a wild state, it has been contended, and there are some who still contend, that what most of us regard as good species are only entitled to subspecific rank. But this argument is not valid, for the same readiness to interbreed is displayed by the Anatidæ, and few

people, we imagine, would contend that the mallard and pintail, for example, were but subspecifically distinct! On this theme, however, no more need be said. Bearing in mind, then, the composite character of the pheasant as encountered in Great Britain, we may proceed to discuss its habits.

What we may call the parent species of the pheasants of these islands are in their choice of haunts alike; and hence the blend which now makes our pheasant has not been hampered by a conflict of ancestral emotions in its choice of haunts. While they by no means shun the immediate neighbourhood of man, foraging in gardens and shrubberies where such adjoin a safe retreat, they thrive only in country affording thick plantations of oak, hazel, or fir, or a mixture of these, with plenty of undergrowth and long grass, when the soil is sandy and well watered by streams or pools. But they display a stronger partiality for areas covered by reeds and long grass in the neighbourhood of rivers, such being the haunts of the species in a wild state: and where such cover is to be had with us they will forsake the plantations dedicated to their use. Spending most of the day upon the ground, and wandering outwards from their coverts in search of food, they fly but seldom. The homeward journey to roost, however, is made on the wing. Though incapable of sustained aerial journeys, they travel fairly fast, attaining a speed of about thirty miles per hour, though, at need, a considerably higher rate is possible. Nor do they travel high, rarely mounting more than a hundred feet. On alighting they run a short distance, then take their bearings. That their powers of turning swiftly when on the wing are limited is shown by records of birds which have been killed by collision in mid-air. That the pheasant is a bird of relatively limited powers of flight is manifest from the shape of the expanded wing, which is short and rounded. And the correctness of this inference is attested by observations made by the late John Cordeaux, Mr. Millais, and Mr. Donald Campbell. The name of John Cordeaux will be known to all who are interested in ornithology, and probably many will remember the case which he

recorded of two hen pheasants which he shot as they landed on the Lincolnshire side of the Humber, near Grimsby, after having flown over from Yorkshire, a distance of four miles. This must have been a very exceptional flight indeed, judging by the two following instances. Just twenty-two years ago, Mr. Millais tells us, he was shooting at Foyers, Loch Ness, when three pheasants took wing from the south side of the loch, and attempted to cross the lake, which at this point was about a mile and a half wide. The birds rose to a considerable height, and then, after having flown about three-quarters of a mile, all alighted on the water, when they turned round and began to swim shorewards, but were captured from a boat. A precisely similar occurrence was witnessed by Mr. Donald Campbell.[1] Shooting at Dunstaffnage, Oban, he saw five cocks and a hen attempt to fly across Loch Etive, necessitating a flight of at least half a mile. When about half-way across one of them was seen "to fall, or alight, on the water, and its example was immediately followed by the other five. Fortunately the son of the Ardchattan gamekeeper, who was in a boat on the loch at the time, observed the occurrence, and rowed to the spot; but as he had some distance to go, by the time he reached the birds they were very much exhausted and half drowned, and were drifting with the tide. He got them into the boat and took them ashore, and, after being well dried and placed in warm boxes near a good fire, they all eventually recovered." Be it noted the day was cold and frosty, and there was a slight fog on the water. We call attention to the weather conditions because cases too numerous to quote are on record which show that the pheasant, from the chick onwards, will take to the water readily, at need, and swims well. One or two illustrations of this rather striking fact may, however, well be given. In one case a hen pheasant with her brood was flushed. She flew across a pond about nineteen feet wide and four feet deep. Immediately the young scattered, but one, not more than fourteen days old, ran down to the water, entered it without hesitation, and swam

[1] Tegetmeier, *On Pheasants*, p. 12.

safely across. In another, a cock was seen to cross the Usk. Alarmed by a fisherman, "he quietly took to the water like a duck, and, swimming high and with great ease, reached the bank nearly opposite to the spot whence he set out." The stream at this point was running at the rate of about four knots an hour.

Bearing these facts in mind, it is obvious that the pheasant is a bird whose hold on life, as a species, is dependent on the stability of its food-supply. Any marked change in the conditions of its immediate environment must spell extinction, migration being impossible. Under the circumstances it is not surprising to find that the pheasant is an omnivorous feeder. The seeds of weeds, young clover, grass, roots, especially of the ranunculus, peas, beans, wild fruits and berries of all kinds, acorns, and beech-mast, form their staple diet, while animal food is furnished by ants and their larvæ, wire-worms, grubs of the crane-fly, caterpillars even of the hairy species, and other insects, snails, and slugs and worms. They have, however, discovered sources of supply in the nature of animal food which are not generally known. Thus, as was discovered some years ago by Mr. Carr Ellison,[1] in the autumn they search greedily for the fallen spangles of the oak, which contain the larvæ of the gall-fly (*Neurotrerus lenticularis*). To these may be added the slow-worm, the viper, field-voles, and mice.

So readily, indeed, is food obtainable, that were it not for its enemies it is certain the pheasant would become flightless. But both in a wild state, and in the state of semi-domestication in which it lives in these islands, it has many enemies, of whom, in this country at any rate, man himself is chief, even while he sternly represses all other agents of destruction. Among its foes, after man, are, or rather perhaps were, foxes, cats, and other carnivores, rats, birds of prey, and egg-eating birds like jays, magpies, and the rest of the Crow family. The avoidance of these is the factor which has driven it to roost in trees, and on the part of individuals, perhaps, to nest in trees,

[1] Tegetmeier, *On Pheasants*, p. 18.

for many instances of such resorts for a nursery are on record. It is significant in this connection to note that young birds, till half-grown, always roost on the ground.

Having now briefly outlined what we may call the daily round of the pheasant's life, we may turn to that which concerns the reproductive period. There can hardly be any doubt but that this bird is naturally polygamous, though Mr. Ogilvie-Grant and others are inclined to believe that polygamy is a result of the artificial conditions of existence caused by the deliberate slaughter of males, a policy dictated in the interests of sport. It is true that among the semi-domesticated birds of our coverts, instances of monogamy are by no means rare, the male guarding the hen while brooding, and even taking a share in incubation ; and there are many instances of dogs and men being attacked by cocks at such times. Cocks have also been seen attending broods of young. But the contention that the males, in a wild state, remain with the females during the period of incubation, and later take part in rearing and protecting the young, lacks confirmation. Courting begins at the end of March, when the smouldering fires which are to burst forth immediately in strange antics begin to manifest themselves in a more mincing, yet stately gait, the tumescence of the bare skin over the face, and the raising of the "ears" which at other times of the year are lost to view in the general plumage of the head. When displaying to the female of his choice, the wing nearest her is dropped, the scapulars of the same side are drawn down, the tail is spread and twisted sideways towards her, the rump feathers are raised, the head and neck are bowed earthwards, and turned so as to display to the fullest advantage their gorgeous colouring of vermilion and metallic blue and green. Meanwhile, the female walks coquettishly away, or pecks about in apparent unconcern. He then walks round her and displays the other side in a similar fashion, until at last, not so much because of his persistence, as because by now the female herself has become amorous, he is rewarded for his seductive advances. Be it noted

there is no meeting of parties of rival males as is the case among the Grouse tribe: such as do meet engage at once in conflict likely to be serious, for the spurs wherewith the feet are armed are formidable weapons. During such contests the combatants fight after the fashion of game-cocks, with lowered heads, a spring into the air, and a swift, vicious, downward plunge of the spurs. Such combats are rarely fatal, yet the males seem to behave with peculiar savagery towards their mates, spurring them on the back till it is literally torn to pieces: sometimes the wretched female is killed outright by a sudden thrust of the spur into the back of the skull. Curiously enough, the hens sometimes fight with one another during the spring, and the cause of the quarrel may be readily guessed. Mr. Millais has remarked that during the spring the males utter a crooning or chuckling note wherewith to call the females to partake of some special tit-bit he has discovered, and over which, till her arrival, he stands with lowered head and feathers all on end. The state of nervous exaltation which possesses the males at this season is demonstrated by the challenges which distant males hurl at one another throughout their waking hours, making the woods resound with a peculiar and strident "*koch-koch*" uttered two or three times in quick succession, and followed by a flapping of the wings. This wing flapping recalls the like accompaniment to the crowing of the barn-door cock, but in this case the crow precedes, instead of follows, the flapping. But thunder, bands, distant explosions, or indeed any loud noise will, at any time, set all the cock pheasants in a wood calling.

As in the case of the Grouse tribe, there is a second period of display in the autumn, but this is of short duration, and lacks the fire of the spring performances. Curiously enough, the young males begin to fight among themselves in September, and such mock combats, for such we must suppose they are, are continued on into October and November, when they are full grown. Thus, then, the courtship of the pheasant bears no likeness, in its happenings, to

that of any of the Grouse tribe, which have traditions of their own among the game-birds.

As soon as the full clutch of eggs is laid, the male retires and leaves the work of brooding entirely to the female, who has the reputation of being if not a bad at least an indifferent guardian. And this fact tells heavily on the chicks, for, if alarmed, she flies off and leaves them to their fate. Returning later, if she recovers two or three of her brood she is content; the rest of necessity perish. Yet, while incubating, she bestows some evidence of care, since, on leaving the nest in the morning and evening for food, she will cover the eggs with leaves, and takes the precaution to quit and return to the nest on the wing so as to leave no tracks. She has a curious habit, Mr. Millais tells us, on leaving the nest after having first laid an egg, of walking along and flicking bits of grass from side to side and over her back, a habit displayed also, according to Mr. Wormald, by wild duck and reeves. On the whole, however, the maternal instinct seems to be defective, since she will lay in nests made up for her by careful keepers, especially if one or two dummy eggs are added! A case was recorded in *Country Life*, 1907, of a female which was found sitting on a blackbird's nest in a low thorn bush. When found, two young blackbirds were discovered in the nest, and on the ground beneath were her own eggs, which had apparently fallen over the edge of the nest when laid, a fact unperceived by the bird! Pheasants eggs have also been found in deserted nests of owls, hawks, wood-pigeons, squirrels, wild ducks, corncrakes, capercaillie, grouse, grey-hen, and common-fowl. Two pheasants have been found sharing the same nest, and a pheasant and partridge have also been found practising copartnership. She will further often kill her young when hatched, as also will blackheaded-gulls, owls, and wild duck, but in these latter cases apparently only when the young are weaklings.

If it were not common knowledge that the young of game-birds have a longitudinally striped down-covering, the fact has been referred to with sufficient frequency in these pages to have impressed it upon

the reader's mind. But there is an aspect of this coloration that may well be referred to here, especially as it is fraught with important consequences to species which, like the pheasant, display defective maternal instincts. This coloration, then, is certainly of a protective character, and in most young birds in which it appears seems to be all-sufficient. Not so in the case of the game-birds, however, which display an unusual precocity of flight. Considerations of space forbid me to enter into the possible origin of this, but I have discussed the theme elsewhere.[1] Let it suffice here to remark, that in the pheasant, at any rate, this precocious flight is harmful, at least on occasions of sudden alarms, such as temporarily deprive the female of her maternal sense. For the young, scattering in all directions, wander too far, and failing to find their way back perish miserably. It may well be that a similar condition of things in other groups of birds has gradually reduced these precocious powers of flight and perfected the instinct to squat down and trust to the protective coloration—*e.g.* young Norfolk-plovers.

2. THE PARTRIDGES

[W. P. Pycraft]

Although the common or grey-partridge and the redlegged-partridge are both members of the same subfamily—*Perdicinæ*—they are not really so closely related as some would suppose, the redlegged species being more nearly allied to the *Francolins*. They certainly differ markedly in coloration when adult, though their structural differences are not so obvious. In the redlegged-partridge, however, among other things, the legs, at any rate in the male, are armed with an irregular series of blunt knobs of horny tissue, apparently answering to the "spurs" of the pheasant, for example. At best these can

[1] *A History of Birds*, p. 244.

be but indifferent weapons of offence, and whether they are to be regarded as incipient or as vestigial spurs is a point which has never been investigated, or indeed attracted attention. An examination of one or two embryos might set this point at rest. No such excrescences occur in the grey-partridge. Nor have any observations been recorded as to the relative protective values of the plumage in these two species. Does the uniform brown colour of the upper surface of the redlegged species afford a more perfectly obliterative mantle than the low-toned variegation of our indigenous species? The similarity of the immature quail-like plumages of the two species is significant. But what interpretation is to be placed on the very marked differences which obtain between the eggs of the two species. Here is a matter on which the egg-collector should have something to say, but his reticence on this, and most other themes concerning eggs, save the numbers in a "clutch," is remarkable. Nothing that has so far been recorded of the life-history of the two species affords us any clue to these problems, but then, as a matter of fact, having regard to the jealous guardianship which is exercised over these birds, our ignorance of all that pertains to their life-history during the greater part of the year is incredible, and this fact will become at least tolerably apparent as these pages unfold their story.

To begin with, the "common" or grey-partridge (*Perdix cinerea*) is an indigenous species; the redlegged-partridge (*Caccabis rufa*), on the other hand, is an alien. Some seem to have been introduced in the time of Charles II., at Windsor, but these seem to have perished. About 1770 a number were turned down at Sudborne, near Orford, in Suffolk, and at Rendlesham near Sudborne. How these fared does not seem to be certainly known, but it would seem that this bird did not become much known till 1823, when it was introduced into Calford, near Bury St. Edmunds; and from that time onward this bird has held its own, at any rate in parts of England, and this in spite of repressive measures on the part of those who had taken so much trouble to establish the bird as a breeding species! These efforts at

acclimatisation, be it noted, were made by a few keen sportsmen who procured eggs, it is generally believed, from France, and hatched them under barn-door fowls. From Norfolk and Suffolk, which are still its strongholds, this bird has gradually spread into the Midlands. It does not thrive, however, on the west coast, while the northerly confines of these islands prove still more uncongenial.

While the redlegged and the English species live side by side, as in East Anglia, the first named, as a matter of fact, does not prosper with cultivation like its cousin the grey-partridge, which decreases rapidly in numbers as it recedes from cultivated areas. Nevertheless, it is not dependent on what we may call artificial conditions for its well-being. And this because both on the breks and warrens of East Anglia, as well as on the slopes of our northern fells, coveys of partridges have established themselves time out of mind. Here, even when remote from cultivation, these birds hold their own easily, though few in numbers. So long have they been isolated that they may be distinguished by their smaller size and somewhat darker coloration. In the northern parts of the kingdom such birds are known as "hill" partridges and "fell" partridges; and from the fact that the food they get here is, in a great measure, like that of blackcock and redgrouse, their flesh is darker, when served at table, than the birds bred on highly cultivated areas. According to most authorities, the ground whereon the partridge thrives best is that which affords a certain amount of waste-land or heather, which will extend a harbourage during tillage and the gathering of crops; a certain amount of grass, and cultivated land where the soil is light and loamy; and there must be a constant supply of water. Heavy clay soils are bad. In the first place they seem to harbour fewer insects, which are an important element in the partridge's diet; in the second they, in wet weather, hold the water, which forms pools, wherein the young drown, while during drought large cracks appear, down which more or fewer young may vanish. No better demonstration of the need of a certain amount of wild waste-land for the well-

being of this bird can be found than that furnished by Mr. J. G. Millais,[1] who remarks that, in West Sussex "twenty-five years ago gunners used to kill seventy and eighty brace a day; now a bag of forty brace in the season is about the limit. Within the last ten years all the nice wild spots of furze common have been reclaimed; all the old-fashioned double hedgerows have fallen before the billhook; and the few partridges that are left nest by the roadsides, where predatory dogs and boys give them no peace, or in the clover-fields, where the cutting-machine destroys the nests in June. Two years ago I found ten nests in one clover-field thus destroyed." When such adverse conditions prevail, it is useless, as Mr. Millais remarks, to import Hungarian partridges, or to resort to artificial rearing.

To the well-being of the redlegged-partridge access to waste-ground is even more essential; but there must be yet some other factor at work which has limited its distribution over these islands: and this limitation may account for the fact that it presents practically no variation in coloration, wherein it differs conspicuously from the common partridge—of course albinisms, and isabelline varieties, which are pathological phenomena, are not considered in this connection.

So far as recorded observations go, the habits of the two species are much alike; but information, especially in regard to the redlegged species, is by no means plentiful. The nature of the facts so far recorded are of a kind which rather bring out the differences between the two species than their common resemblances. While both species live in coveys, the redlegged-partridge is nervous and restless, by temperament, so that on alarm the covey, as if panic-stricken, breaks up and scatters, reuniting later, whereas coveys of the grey-partridge keep together. The last named, again, seek safety at once in flight; the former prefers to run, and is with difficulty flushed, a habit which forced itself upon the attention of sportsmen so soon as the bird had become well established. As a consequence

[1] *The Natural History of British Game-Birds.*

this experiment in acclimatisation brought with it a speedy repentance, owing to the adverse effect it produced on the dogs. So great, indeed, was the dislike finally provoked by the newcomer, that its eggs were destroyed as they were found, or on some estates were used for table purposes. Nevertheless these measures did not succeed in exterminating what was then regarded as a pest. A further charge levied against these aliens was that of pugnacity, a widespread belief having gained ground to the effect that the males drove away the native, grey, or English bird, which from every point of view would have been a deplorable event. Time, however, has reinstated the redlegged species. The old methods of shooting over dogs have now given place to "driving," and this ultimately forces the laggards to fly, and furthermore inflicts a heavier toll on their numbers than in the case of the English bird. And closer observation has shown that, so far from the larger redlegged species driving out its neighbour, the reverse is the case, for the English partridge is decidedly the more pugnacious species.

The French partridge will often perch on fences, the low bough of a tree, or even on a barn or wall. The English partridge is commonly believed never to adopt such resorts; but according to Yarrell it will perch on the limb of some large tree if the ground be covered in deep snow. The French partridge, again, has been known to nest on haystacks, cornstacks, and even in a tree, and Mr. W. Farren tells me he has known cases of nests placed far down in rabbit burrows; but such vagaries seem rarely to be committed by the English partridge, though a case is recorded in Daniel's *Rural Sports* of a nest of sixteen eggs on the top of an oak pollard, which were successfully hatched out. The English partridge will bathe occasionally, and both species are exceedingly fond of "dust"-baths. The English species shows a preference for some sandy knoll screened from observation by bracken; here they "busk" to their heart's content, having spent the early hours of the day, from dawn till about 10 A.M., in feeding. That the French species displays

similar predilections is rather a matter of inference than of definite observation. A curious point, which may fittingly be referred to here, concerns the roosting or "jugging" habits of the English partridge, on which, strangely enough, diametrically opposed assertions have been made. It is generally asserted that this bird at night resorts, in coveys, to the most open spots available, and there forming a circle, with the heads facing *outwards*, they sleep, prepared, as well as sleeping birds can be, to meet prowling carnivores at any point. Yet no less an authority than Mr. J. G. Millais assures us that in this magic circle the birds sleep with the heads facing *inwards*. Now it seems clear that both assertions must be based rather on inference than on actual observation. The particular inference seems to have been founded on the assertion that at such roosting-places the mutings, or droppings, are arranged in a circle. It is difficult to find any proof of this, and from what is known of the behaviour of birds roosting on the ground, they would all turn head to windward. Only, it is said, when the ground is covered in deep snow does the partridge seek some large low bough for its nightly rest. In how far the redlegged species agrees with the English or "common" partridge in this matter of roosting habits I can find no records.

Neither the English nor the French partridge are migratory birds in the strict sense of the word, yet in both local migratory movements have been recorded. The former is said, regularly, to cross the Solway Firth from the slopes of the Dumfriesshire hills to the new cultivated area of the Cambrian Plain, every autumn; while Millais tells us that every year a few broods of "hill" partridges reared in the Perthshire mountains about Dalhousie return to the lower straths at the beginning of winter.

These movements, be it noted, relate to birds in their northernmost range, and take place apparently to escape the rigours of winter. The French partridge, on the other hand, seems to show at least incipient, or perhaps vestigial, migratory movements during the spring. We suggest vestigial because they may be remnants of

Peregrine-falcon and redlegged-partridge
By G. E. Lodge

PLATE III

normal migratory movements performed by the ancestors of these birds before their importation into England. What evidence there is of migration has been recorded chiefly by the late Henry Stevenson and John Cordeaux, who reported, during the course of many years' observation, many instances of French partridges having been taken, at various points on the east coast, in an exhausted condition, while in some cases they have been seen at sea, flying landwards, at a distance of five miles from the shore. But both these observers were men who enjoyed, and who had earned, a high reputation as ornithologists, and both regarded such "migrations" as uncontemplated excursions, or at any rate as journeys made from the land seaward, and back in a detour, a sort of random voyage of discovery speedily repented of. And this view is surely the one which will still find most favour to-day.

If the partridges of our islands escape the perils of migration, they have at any rate, in common with all other birds, at least one trying period to pass through, and that is during the annual ecdysis or "moult." Among many species, indeed, this is a bi-annual event, and so it remains until the juvenile stage is past. There are, however, in *Perdix cinerea*, at any rate, remnants of a double annual moult, in kind precisely similar to that presented by the blackcock (*Lyrurus tetrix*): that is to say, there is a partial "eclipse plumage" which is confined to the head and neck. The existence of such an "eclipse" dress was first discovered by Mr. G. E. Lodge, an ornithologist of ripe experience and keen judgment, and was later worked out in detail by Mr. W. R. Ogilvie-Grant of the British Museum. He pointed out that from July to September the head and neck of the cock is of a light umber colour relieved by very narrow shaft-streaks of buff, each feather, further, having a narrow black border. Birds killed in September, having the head and neck thus marked, had hitherto been regarded as very "forward" young birds; and this likeness to the immature—and therefore ancestral—plumage is significant. As a matter of fact, however, the feathers of this area, in such young birds,

are always of a sandy brown colour, and with wider and more conspicuous shaft-stripes. Mr. Grant further discovered that the adult female similarly assumes a partial "eclipse" dress which is worn from May to September—a much longer period than in the case of the male. The "eclipse" feathers here are of a sandy brown, with a buff shaft-streak, and mottled or barred with black; usually there is also a buff subterminal spot.

Having now reviewed what we may call the general life-history of the partridge, we turn to the all-important series of events which is associated with the continuance of the race. But it is somewhat surprising to make the discovery that really, when all is said and done, only glimpses of the pageant have yet been obtained.

Both *Perdix perdix* and *Caccabis rufa* are monogamous species, and, so far as is known, neither presents any very striking features in regard to their courtship. Though the common-partridge pairs early, it "jugs" for a time in company with its fellows, but on the first burst of warm weather towards the end of February the coveys break up and each pair betakes itself to some secluded spot. Whether this is true also of the redlegged species or not no one seems to know. Of actual courting habits, only a very nebulous history can be gleaned as to the common-partridge, and nothing whatever of this important phase in the life-history of the redlegged species. So far as the amatory display of the common-partridge is concerned, all that we can definitely fasten on is the fact that as soon as warm weather sets in the cock, already paired, becomes demonstrative, calling loudly, jerking his tail, and assuming a defiant attitude, challenging all whom it may concern; while the female squats in the demure acquiescence of one who revels in being possessed! Commonly the challenge is accepted by some unattached male, who approaches either in a series of jerky runs, or with a headlong dash. Then a fight begins, wherein each bird flutters up a yard or two and endeavours to strike his antagonist with feet, wings, or beak, aiming, generally, at the top of the head. At last one is vanquished—generally the challenged—

pursued by the victor, who then returns to his mate. Occasionally, no doubt, the "man in possession" is dispossessed. But be this as it may, during the progress of the fight the female is said to run round and round the combatants, uttering the while a series of peevish notes, flapping her wings, and raising and depressing her body. What may be called the "tourney" ground is frequented for some days, but sooner or later the paired birds betake themselves to more or less remote recesses.

There is certainly much that is unsatisfactory, much that requires explanation, in the foregoing account, but what *are* the facts of the case, what *is* the interpretation of such phases as have been from time to time recorded? These are questions which for the time, at any rate, must remain unanswered. The solution of the problem is rather hampered than otherwise by the statement that females often fight for mates, at least this would appear to be so judging from a letter to the *Field* (July 1909) by Mr. J. B. Waldy, who relates the following interesting facts. "A friend of mine," he writes, ". . . had as regular visitors last year a pair of partridges, the hen being easily recognised, as she had lost one foot. At the usual time they brought off a brood, but were not very lucky with their young ones, which were gradually reduced in number until only one was left. This, with the old pair, regularly visited the garden, where they were fed throughout the winter until the pairing time came, when the young one, which proved to be a hen, fought a series of battles with her mother, eventually drove her away, and mated with the old cock. . . . It all came right in the end, however, for after a week or two, when she had been given up as lost, the old hen came back with a new mate, with whose help she vanquished and drove away the other pair from the garden and field, where she has remained undisturbed ever since." It is certainly open to question whether this female would have so easily been vanquished but for her maimed condition, and it is also somewhat remarkable that her mate did not rally to her aid, more especially since she and her new mate acted in concert in driving away this

highly reprehensible pair. On the whole, though it has been stated that rival females fight for mates as fiercely as the males, the evidence therefor seems to need further confirmation.

The choice of a nesting-place seems to be left to the female—heather, coarse grass, bracken, gorse, or bramble thickets being favourite sites, and where these cannot be found, then wide hedge-rows, clover, and hay-fields have to suffice. Occasionally two or even three hens will lay in the same nest, but no observations seem to have been kept in such cases as to whether the three mothers share the duties of incubation. Occasionally nests containing both partridge and pheasant eggs are found, the brooding bird being sometimes the pheasant, but more often the partridge; and it is believed in such cases that the smaller bird has established sole possession by right of force, for the pheasant is proverbially an indifferent mother, and would doubtless soon give way if repeatedly attacked even by a rival so much her inferior in size. But be this as it may, the arduous work of incubation is apparently undertaken by the female alone, who is said, when sitting, to avoid the dangers which beset her from prowling foxes and other carnivores, by withholding her scent. But this is surely pure guesswork; at any rate no evidence worthy of the name has ever been adduced in support of this theory.

Comparisons are odious, and one hesitates to set the behaviour of one species against another when in the face of danger. Thus, while it may be true that in the defence of their downy young the ptarmigan display more reckless courage than the partridge, it is to be placed to the credit of the last-named species that it has afforded proofs of regard for its unhatched young which cannot be matched in the case of any other game-bird. This much appears from evidence collected by Jesse, and quoted by Yarrell.[1]

The story runs as follows:—"A gentleman living near Spilsby, in Lincolnshire, was one day riding over his farm and superintending his ploughmen, who were ploughing a piece of fallow land. He saw

[1] *British Birds*, vol. iii. p. 107.

Partridges
By A. W. Seaby

PLATE IV

a partridge glide off her nest so near the foot of one of his plough horses that he thought the eggs must be crushed. This, however, was not the case; but he found that the old bird was on the point of hatching, as several of the eggs were beginning to chip. He saw her return to her nest the instant he left the spot. It was evident that the next round of the plough must bury the eggs and nest in the furrow. His surprise was great when, returning with the plough, he came to the spot and saw the nest indeed, but the eggs and bird were gone. An idea struck him that she had removed her eggs, and he found her, before he left the field, sitting under the hedge upon twenty-one eggs, and she brought off nineteen birds. The round of ploughing had occupied about twenty minutes, in which time she, probably assisted by the cock bird, had removed the twenty-one eggs to a distance of about forty yards."

When birds have the temerity, or stupidity, to lay in a nest near a frequented pathway, the chances that the eggs will be discovered and taken, or accidentally trodden on by some passer-by, are many; yet the Rev. H. A. Macpherson remarks he has known of a case where a portion of a clutch was thus destroyed, and the remainder hatched out by the cock, the nerves of the hen having been so shattered by the accident that she could not be induced to resume her duties. He further remarks that a hen brooding in an exposed situation will commonly cover her eggs with leaves before going off to feed. (Pl. II.)

As a rule, at any rate, the male takes no part in incubation, but while hatching is in progress, Mr. Farren tells me, the male assists by taking the young birds as they emerge and brooding them; and further, that when she leaves the nest to feed, he accompanies her and helps to find food. When foraging the male runs ahead, then stands for a few moments surveying his immediate surroundings. If all seems well he goes on, uttering a low "*zut-zut*," while the hen, crouching low, follows with her brood, seeking seeds and insects as they run. On the slightest suspicion of danger the male utters a clucking alarm-note, and at once flies off, thereby distracting atten-

tion from his family; meanwhile the hen and her chicks crouch low and make off among the undergrowth with all possible speed. In a few days, however, the young are able to fly, and thus danger is to a certain extent lessened. But so long as there is need, both parents will display desperate courage in defence of their young. When the ruse seems likely to succeed they feign injury, and flutter along the ground as if endeavouring to persuade the pursuer that he has but to make one more supreme effort to seize the stricken bird, but invariably before this happens the lure rises on the wing, and speeds to a place of safety. Meanwhile the chicks have scattered in all directions.

But the partridge realises well enough that there are times when strategy is folly. Thus Yarrell relates an instance where "a person . . . had his attention arrested by some objects on the ground, which, upon approaching, he found to be two partridges, a male and a female, engaged in battle with a carrion crow; so successful and so absorbed were they in the issue of the contest, that they actually held the crow till it was seized and taken from them by the spectator of the scene. Upon search, young birds, very lately hatched, were found concealed amongst the grass." Such formidable foes as the hen-harrier, stoats and weasels, and dogs, are similarly attacked with dauntless courage, and with success. Man alone seems to escape such attacks, and it is only on this account that the ptarmigan enjoys a reputation for superior courage. But the partridge has long lived in the midst of the human race, and has perchance learned the futility of resistance to such a foe.

In how far the redlegged-partridge agrees with its cousin in all that pertains to the period of reproduction we cannot yet say, for long though this bird has been resident among us, little save the colour and number of its eggs has been recorded! This is certainly not to the credit of British ornithologists, who are fond of insisting that we have nothing more to learn of our native avifauna.

3. THE QUAIL

[W. P. Pycraft]

Time was when the occurrence of the quail within our midst was a matter which called for no particular comment. To-day the fact is eagerly recorded, not only in the newspapers but in our ornithological journals, for the quail is going, if it has not gone, the way of the bustard and the bittern, and a dozen or so other species. Our grandfathers can record pleasant days spent in shooting quail, and they have, indirectly, established the fact that in its habits it resembled the partridge (*Perdix perdix*), affecting the same haunts, and preferring the same food, and to this scanty information but little more is to be added. And this because, keen though many of our forebears were on the subject, at any rate of our native game-birds, their interest lay in their pursuit, and not in the contemplation of their domestic economy, and we who have followed them have done little better.

Great as are the gaps in our knowledge of this the smallest of our game-birds, the facts that have most impressed themselves upon us are just those wherein it contrasts most strongly with its congeners. In the first place, though displaying but feeble powers of flight, inferior even to those of the redlegged-partridge, it is the only migratory member of our native game-birds. And while more or fewer birds remained with us the year round, the majority left us in October to return with the snipe in May. We may be reminded that the journeyings of the quail are no more wonderful than those of the landrail. And this is true, but we are laying emphasis not so much on its limited powers of flight as on its migrations, for the wanderings of our "common" quail and one or two nearly related species are, it must be remembered, remarkable among the game-birds, which are else, all the world over, a sedentary race.

The migratory habits, and the peculiarities in plumage, further

single out the quail as the most primitive, the least specialised, of all our game-birds. More than this, if we extend our survey so as to include all the members of the genus *Coturnix*, then our quail may stand as one of the most primitive of all the *Gallidæ*. The contention that the plumage of the members of the genus *Coturnix* approximates very closely to what must be regarded as the ancestral plumage, at least of the *Gallidæ*, rests on the fact that longitudinal stripes form its most striking feature.

To realise the full significance of this we must turn to the juvenile dress, which undoubtedly answers to the ancestral adult dress. And in proof of this, so far as proof is possible, we need only turn to the juvenile dress of the partridges, which have departed scarcely more from this standard. They have, however, traversed thus far, that the juvenile dress of the common and redlegged-partridge bears a greater likeness—details apart—to that of the adult, than to the juvenile dress of the quail.

Why so charming and so interesting a bird as the quail should be branded as a bird of "skulking" habits it is difficult to understand, for if ever a bird had cause to shun even the suspicion of proximity to man, that bird is the quail. Yet more than one writer has applied this offensive description, when it would be more "sportsmanlike" and more accurate to say that it displayed an unusual alertness and keenness to the presence of danger, and no less skill in avoiding exposure. When pugnacity and desperate courage are called for, the quail is never the bird to seek safety in hiding. This is apparent at once so soon as we turn to the records of its behaviour in the tourney field, whereon, like its larger relatives, it lives for a season during the period of courtship. In all that pertains to this phase of its life the quail again resembles its cousin the partridge. Nay more, as a duellist the quail outdoes the partridge. Travelling like good comrades together over that perilous journey from Africa to our own shores, the males reach us some days in advance of the females —when they come at all—and no sooner have they landed than they

Quail
By G. E. Lodge

proceed to spread themselves over the land, each appropriating to himself as much territory as he can conveniently hold. Then, apparently, each begins to challenge his neighbour as if eager to try conclusions with him, in the hope that presently he may annex both his territory and his prospective mate. The challenge, a curiously insistent and metallic "*click-a-lik, click-a-lik,*" is kept up until sooner or later one or other is sufficiently infuriated to charge upon his neighbour. The fight seems to differ in no way from that described in the case of the partridge, save that it is more sustained, and carried on more fiercely; so much so, that it can end only when both are exhausted, or one is killed.

After such fashion, it would seem, the fates determine whether the victor shall, for that season at any rate, be a polygamist, or shall conform to what is perhaps the more expedient rule of monogamy. At any rate, all authorities seem to agree that the quail in its marital relations may follow either custom. Another determining factor, no doubt, is the relative numbers of either sex which succeed in escaping the diabolical persecution which is meted out to them on migration by "civilised" man.

The duties of incubation fall, apparently, to the female alone, who is a close sitter, so much so that, if carefully approached, she may be stroked or even fed upon the nest. But so soon as the eggs are hatched, the male comes eagerly forward to do his share in guarding and fending for the brood. Two broods or "*bevies*" may be reared in a season.

And now as to the scarcity of quail in our islands to-day. In the latter part of the eighteenth century these birds were fairly abundant; some remained throughout the year, and the numbers were largely reinforced by immigrants in May. In such plenty did they occur that large numbers were snared and netted by fowlers, who lured both males and females by a marvellously faithful imitation of their call. To-day, as we have already remarked, this charming little bird—delicious some would say—is so rare that the taking of specimens

is deemed worthy of record in ornithological journals. Mr. Millais puts down this decline "to a considerable extent" to drainage and high cultivation. Yet both he and all other writers agree that the quail thrives best where the partridge thrives best—in cultivated areas. It is certain, then, that we must seek elsewhere, and much farther afield, for the reading of this riddle.

Quail, unfortunately, have from time immemorial found favour with the gourmet, who asks no questions, for conscience' sake. To supply his demands, a positively appalling annual slaughter of quails takes place, and has taken place, for more years than one cares to contemplate, during the spring migration, as they cross the Mediterranean from the south on their way to their breeding quarters, and again on their return journey from Europe towards the end of September. The vast hosts which cross this route are netted by hundreds of thousands, and placed in large low cages, darkened to prevent the prisoners from fighting. Herein they are packed so as hardly to be able to stir, and by the time they have reached the end of their dreadful journey, a large proportion of the captives have died, so that vast as is the number annually consumed, the numbers which are thrown away are almost as great. In one season over a million quail have been taken on the island of Capri alone. According to Mr. Whitaker,[1] Egypt is the country in which most of this netting is now done, and Marseilles the chief port of consignment, some seasons hundreds of thousands being landed there. Obviously this is a matter which calls for international legislation, but international legislation is a very broken reed to trust to.

So far only a bare reference has been made to the "song" of the quail, that is to say, the call of the male, and this because it seems hopeless to express this in human speech. At any rate, though numerous attempts have been made to set this "music" to words, the several results only serve to cancel one another out. According to the most common rendering—which, after all, means that which

[1] *Birds of Tunisia*, vol. ii. p. 251.

has most frequently been copied by one author after another—the call of the male resembles the words "*clik-a-lik*," or "*whet-my-lips.*" Mr. Whitaker, who writes from his own experience, renders it "*whit, wes-whit.*" The German version has it, "*Buck-den-Ruch*," and the French "*J'ai-du-blé, j'ai pas dé sá*" (sec)! The responsive call of the female is a gentle note like "*few, few*," or "*pew-pew.*" But however difficult these notes may be to express in terms of common speech, it is readily enough imitated by mechanical means, so that fowlers, who of necessity must be skilled performers, used in days gone by, in this country, to snare large numbers by alternately reproducing the call of male and female. It appears unlikely that this means of earning a livelihood will ever again be possible to the birdcatchers of Great Britain.

III

RED-GROUSE, BLACK-GAME, CAPERCAILZIE, AND PTARMIGAN SHOOTING

By the Hon. Douglas Cairns

1. THE RED-GROUSE

It is impossible to regard the red-grouse merely as a bird of sport: he is a national asset, exclusively British, save for certain experiments in acclimatisation elsewhere, and, so far at any rate as the Highlands of Scotland are concerned, the main bulwark against bankruptcy. A glance at the Valuation returns of any of the essentially "grouse counties" will reveal an alarming shrinkage in rateable values during those years of war when moors were unlet or let at a fraction of their pre-war rents. A periodical scarcity of grouse, whether due to disease or inclement weather at the critical period, will shed light on losses more directly personal, in connection both with let moors and those shot over by the owner and his friends. For instance, in a district where driving on up-to-date lines is the prevailing custom, the boys of a family in the crofter or small artisan class will be engaged for some six successive weeks, the fixtures being arranged by the various occupants of lodges with a view to avoid clashing. The resulting £40 to £50—we are supposing the family to contain four boys: the days of "a hare and a shilling per diem" are past—will do a good deal more than cover the family boot bill. Even the keeper, whose wages have by no means kept pace with the general rise, is hard put to it in a "bad year," entailing the absence of that succession of guests whose "tips"—a tax, usually ungrudged, on sport—may represent the fund from which he derives

present comforts, and the hope of stocking a farm in the future. After all, he has no Trades Union wherewith to harry his employer, and few classes show a better war record. Charities, entertainments, assistance to the poor, comforts for the sick, provided by the occupants of shooting-lodges, are taken almost as a matter of course, but are none the less a very real part of the lives of such as benefit therefrom.

Had the red-grouse never existed, or had he been exterminated before the art of shooting on the wing became fashionable, many parts of the Highlands would have remained practically undeveloped: roads and railways, if present, would constitute a heavy charge on the State; emigration, overseas or townwards, would have completed the devastation begun by the large sheep-owners, whose employment of labour was infinitesimal when compared with the modern horde of artificers and merchants, heather-burners, bracken-cutters, roadmakers, and others deriving their livelihood from the occupants of shooting-lodges as surely as the men and boys directly employed in the prosecution of the sport. Fortunately for the grouse and his shooters, his preservation is in no sense antagonistic to sheep-farming—a fact which removes him, or ought to remove him, from the category of political birds. Heather-burning and sheep-gathering, of which the conduct by the shepherd acting in his own interest only might cause the sporting tenant some anxiety, are now usually matters of co-operation and accommodation respectively. The shepherd is no poorer thereby. In the "grouse districts" of England and Wales, famous for the heavy bags obtained annually for the last fifty years, and famous—at any rate *quâ* Yorkshire—for the production of writers ready to assert the supremacy of their native county in all that concerns grouse shooting *versus* the rest of Britain, rents are not so high as in Scotland, according to the reckoning per brace. Possibly the number of days' pleasure, apart from the "best" days, is more restricted. Many Yorkshire moors are rented by syndicates, of which the members take their three or four days' shooting and then disperse till they reassemble for the next visit. Another factor in fixing values is without doubt Fashion, spelt advisedly with a capital F. But, *mutatis mutandis*, there is the same employment of labour. Double sets of drivers entail

a big wage bill. One of the features in a shooting-party at Wemmergill, a Yorkshire moor enjoying and deserving a reputation not merely for numbers killed but also for the quality of shots afforded (the butts being placed in the best drives, on the banks of a "beck" flowing between high cliffs), is, or was, the attachment to each gun of a sturdy dalesman with his own pony carrying sometimes his patron, always the latter's ammunition and other necessaries, and also his luncheon when circumstances required that this should be eaten in the butts during a waiting interval.

Grouse-driving assuredly has its great moments. It has also its critics. Of the latter, the majority are journalists and their disciples. The minority, the "old sportsmen" purists, must, for all their love of the old style and their antipathy to *fin-de-siècle* luxury, admit that the late Lord Walsingham's single-handed feats demanded more than mere accurate gunnery. The man possessed of sufficient endurance, physical and nervous, to kill (in 1872) 842 birds, and sixteen years later, 1,070 birds, and who, starting at 5 a.m., could shoot his way home in the evening, would probably have stood head and shoulders above any contemporary, at any period, in any style of shooting; but it must be remembered that Lord Walsingham had graduated at a date when large bags and their luxurious attainment were unknown.

Quite a small percentage of modern grouse shooters have had any opportunity of acquainting themselves with the sport as pursued "over dogs": it is their misfortune to be thus lacking in a good deal of the knowledge whose possession separates the sportsman from the shooter pure and simple; also—and the misfortune here is none the less—to have been born too late to witness the display of those qualities characteristic of the highly-bred pointer or setter, and of him alone; the specialised brain-work, speed, stamina, and indefinable "style," all hereditary, and all developed and controlled by the hereditary skill of his handler. True, a considerable number of hired dogs are in use. Could we but endow these with the gift of speech, what interesting tales would be forthcoming with regard to those who use, or abuse, them during the brief period of enlargement from their dreary kennels.

Shortage and cost of labour during the war gave this business quite a fillip. But shooting over hirelings is an affair very far removed from the ideal; some of them are good, many execrable. Results are best when a man to whom the dogs are accustomed is hired to work them. Colonel Thornton cautions "gentlemen always to keep their own dogs scrupulously to themselves, and to have a set allotted to strangers; for many good sportsmen differ in their manner of treating their dogs. . . . I conceive the great pleasure and elegance of shooting depends on the good order in which the dogs are kept." The Squire of Thornville Royal's opinion of hired dogs, had they existed in his day, can be imagined by the reader of his record of a princely progress, with its accompaniment of wine-wagons and iron punts.

To change in the habits of the grouse seems to be attributed the bulk of the blame, or credit, for the supersession by driving of the older method of pursuit: in reality, however, that change was partially wrought by, and inextricably interwoven, as it were, with changes in the habits of the British sportsman, increased facilities at his disposal in the matter of firearms and locomotion, and the resulting accession to his ranks, in vast numbers, of a class to whom point-shooting and pointing-dogs were of little interest. The pointer, or setter, as originally employed in the taking of game—to wit, partridges and quail—by nets, was a necessity. On the introduction of the art of shooting birds on the wing he was almost equally indispensable, and accordingly ranked as one of the adjuncts to the country house. But the country gentlemen who specialised in these breeds with enthusiasm sufficient to reconcile them to life in a roadside moorland hostelry, and the discomforts of a journey thither by stage-coach, were incomparable in number[1] with the horde of shooters brought into action by such innovations as the railways, the breech-loader, and the appreciation of mountain scenery, for before the days of Sir Walter Scott mountains were, to plain-dwellers, all barren and horrible. The professions were followed by commerce in the fashionable

[1] And decreasing with the growing disuse of the pointer in England, due chiefly to mechanical reaping and short stubbles.

northern migration. The primitive lodge[1] replaced the lonely inn, destined in its turn to be scrapped in favour of the luxurious dwelling-house when driving necessitated the accommodation of a large party, ladies included.

Intensive preservation and vermin-killing, and heather-burning on a large—too large—scale, produced a general stock of birds such as had hitherto existed in the most favoured localities or seasons. A heavy stock means almost inevitably increased wildness, for nothing is more contagious than fear. With decreased cover, safety was sought in the air rather than on the ground: burnt patches, usually too large (a mistake now recognised and avoided), led to the joint assembly of coveys on the feed, and consequent early packing, a state of affairs prevalent, for example, in Yorkshire in the middle of the nineteenth century, when driving was practised and a bag of 50 brace considered a good one.

The failure of "point-shooting" to keep numbers down to the food-limit in these heavily-stocked districts was inevitable, the physical contour of such moors being usually of that very nature, namely, flat or gently undulating, which precludes success owing to difficulty of approach. In Caithness, the "dogging" county *par excellence*, the contours are mostly of this formation; but not only is there more cover, but also the grouse are later in nesting, and the immature young birds act as anchors to their parents, thus facilitating the killing of the latter. On moors consisting of more broken ground, less densely populated, and not carelessly burnt, the failure indicated above was largely due to the *abuse* of "dogging": to ignorance of the elementary principles which ought to regulate its practice, of which the first and most important is to subordinate the bag to the ruthless selection of old birds first. The neglect of this rule makes point-shooting appear very easy. Easy it is, if wrongly conceived and executed. The parent birds, allowed once to escape, will on the next occasion rise out of shot, probably taking their broods with them, themselves surviving to qualify in time for that sterile, cunning, and land-greedy band which either infest the tops and

[1] The writer made his entry into the world in a lodge where one of the hill ponies put his head through the lath-and-plaster wall dividing the stable from the one living-room.

high-lying peat bogs, or monopolise good ground which ought to produce coveys.

The pursuit of these case-hardened sinners with a dog who knows them, *and knows you,* is probably the most interesting form of point-shooting. Your ally must be old enough to be beyond spoiling by the liberties you will take with him, and a past master in the science of working down wind. Most of the old cocks you will secure by manœuvring to "pin" them between yourself and the dog, with whose every movement or gesture, even the flicker of an eyelid, you must be familiar. Need it be added that a hireling is not quite "in the picture"? One gun is better than two, being more conducive to rapidity and silence, without which the result will be meagre. The man who works the dog should obliterate himself as far as possible, avoiding all the favourite gestures and leaving at home that odious whistle, an instrument of priceless value to the grouse as a life-saver.

The dog excelling all others for grouse shooting was the black pointer, a breed brought to perfection and jealously guarded from morganatic alliances by several Scottish landowners, and later by Mr. William Arkwright, whose sumptuous monograph should be included in every sportsman's library. Irish setters of certain strains are wonderfully clever, and have one decided advantage over pointers of any breed—that is, an old favourite will come in handy for snipe shooting after the grouse season is over, whereas the pointer's coat unfits him for that purpose. The colour of both these varieties renders them difficult to "pick-up" against the usual moorland background: a white collar is of material assistance.

Observation of the flight of grouse, ever varying with the wind's direction, when disturbed by shooters in early days, must have been of great assistance in the choice of sites for butts, or, as they were originally termed, "batteries" (North of England) or "boxes" (Scotland). For to build these under the probable line of flight is the right plan; an attempt to force grouse to butts erected heedlessly of this probable line is doomed to failure incomplete only on a dead flat. Burns, sand-pits, walls, even rocks, intelligently selected for concealing guns have justified,

and continue after three-quarters of a century to justify, this selection, so consistently is the flight of grouse dictated by contours. Even in Scotland, where methods were at first derided (and results subsequently envied) by the "purists" of Yorkshire, butts erected in 1866 are still used with success.[1] About the same date a driving bag of 200 brace was recorded in Nithsdale, where no doubt the handling of black-game by similar methods was of considerable educative value. Farther north, the impossibility of reducing by older methods the stock left by a succession of good seasons in the early 'seventies, with the resulting shortage of food in the lean months, and disease, were responsible for an extension in the practice of driving which developed rapidly and is still developing. Procedure at first was primitive: drivers were allowed to advance in a straight line, the birds "leaking" out freely on each flank. One can remember the array of pink calico flags and the noise! One can remember, too, the astonishment experienced, very many years later, at hearing a din no less terrifying on the famous Wemmergill moors; the shouting proceeded without intermission from a perfectly-maintained "horseshoe formation" of Yorkshiremen armed with lusty lungs and ever-wagging flags. The end certainly justified the means: the birds appeared to remain on the wing for a comparatively long time, and to lack the definite objective in their flight, the presence of which, on moors of a more broken or hilly nature, would render such terrifying tactics inoperative or fatal to success. No doubt in a country where flight is strong and prolonged, grouse readily find their way home after "the tumult and the shouting dies." And this aerial habit cannot but encourage a mixing of stocks, to the advantage of the race.

North of the Border the skilled "flanker" trusts less to noise than to a sudden appearance from his lair in a peat bog, emphasised by his flag. But this appearance must happen just at the psychological second, and the use of the flag demands consummate discretion, especially on the windward flank. The merest flick will "feed" the flank butt, or the line, as may be desired. Often, again, the flag must remain furled;

[1] On the Earl of Home's Lanarkshire moors.

a bungler can do incredible harm. The gun on either flank of the line of butts can often make quite a good score at old singles or pairs whose experience inspires them to sneak wide of the line; if he and the flanker know and trust each other, there need be no occasion to lament the position allotted to him by the "draw." The days are long past when butts were built 70 or 80 yards apart, not merely to cover more ground, but also to reduce the danger of accidents. The *raison d'être* of a long line has vanished with the horseshoe formation of drivers in touch with the flankers; while, as regards danger, it was soon recognised that a bird passing between two butts 80 yards apart was only within fair killing distance of either when in a more or less direct line between the two. Half the original distance is now considered ample, and under certain circumstances, much less. Fifteen yards is the interval between butts in one of the drives on The Mackintosh's moors at Moy.

In the architecture of the butt itself, its material, shape, and elevation, we find a variety as wide as exists in the case of more permanent human habitations. Stone, handy and easily worked, facilitates the construction of a luxurious building with a solid floor conducive to the nimble footwork which is held by some to be essential to rapid accuracy. A wooden rest for guns prevents damage. In the absence of suitable stone, batten floors are apt to be slippery, and are unnecessary if due attention is paid to drainage. Square butts are an assistance to a quick grasp of one's position relatively to that of one's neighbours, but the circular semi-sunk form is now generally admitted to be the most deadly. In some parts of the Highlands the builders of such butts display considerable ingenuity in camouflage, the sloping rims so effectually harmonising on the outside with their surroundings that a stranger has been known to lose his whereabouts within a short distance of the line. Posts or other marks alternating with these butts obviate, or ought to obviate, any risk of danger. Whatever form the individual butt may assume, it must include ample space for the shooter, his loader, and his dog. Small butts mean muzzles choked with peat, and dinted barrels.[1]

[1] The most frequent cause of dinted barrels is the metal disc above the point of the shooting-seat in general use. This should be covered by two projecting discs of stout leather, sewn together at the edges.

The construction of a line of butts in exactly the right position to intercept the birds' flight, of sufficient length to enable the line of occupants to move up or down according to the wind which regulates that flight, so placed as to afford to each gun a sufficient view in front, is a difficult matter. The difficulty is accentuated by the necessity for maintaining an absolutely true line, ensuring not merely safety, but that semi-instinctive knowledge of safety required in order to obtain the best results. For double drives, two lines of butts are always better than one single line. One or two butts may serve a double purpose, but never the whole set. The ideal situation is behind a ridge, at a distance sufficient for a fair view. Butts placed in a deep ravine, as at Wemmergill, afford magnificent and spectacular shooting; if, however, birds coming high and fast are dropped against a rocky face they are apt to be badly smashed. Except on flat ground, one or two markers concealed well behind the line will more than repay the slight additional expense. In hilly country it is noticeable that wounded birds have certain "pitching spots," usually chosen for reasons connected with wind and shelter.

The pick-up after a drive should be done by hand, so far as is possible. To allow birds lying in view to be mouthed by a dog is bad for the larder, and worse, far worse, for the kennel. The dog is wanted to hunt for birds which his master cannot find—that is, to use his nose, not his eyes. Each quest should be treated as an individual item in the day's work, having its beginning, direction, and ending all by order. This being a counsel of perfection, seldom observed, it will be readily understood that the best grouse-driving dog is usually not the most suitable for other forms of shooting requiring work of a less promiscuous order. But in any case a jealous dog is as great a nuisance as a jealous master; the pick-up is apt to expose the worst traits in the character of both. As to his breed, the pure Labrador is now rare, and the curly-coat still rarer; both were excellent. A smaller dog is handier in a car or railway carriage. A spaniel, provided he is sufficiently "on the leg" to travel over heather, now seldom very long, has much to recommend him; a slight setter cross

will give him a higher head-carriage and more command of the air, besides exposing him to less irritation of the nostrils by pollen.

Under circumstances which preclude driving or point-shooting, walking in line is often practised, and can sometimes be justified as an efficient method of killing old birds. For instance, on a beat of rocky tops intersected by heathery hollows, two or three guns who know the ground can do better than half a dozen strangers, walking down-wind and thus stealing on the birds lying in shelter. On steep faces up-wind is the rule, and the stronger the wind, within reason, the more curly and interesting the shots, especially to and over the lowest gun.

In certain parts of the Border country are isolated patches of moor, varying in extent from a few acres to a thousand—islands, as it were, in the midst of pasture and arable land. These "flows," as they are termed, carry a breeding stock of grouse, and are provided with one or more lines of butts. The shooting, which usually takes place in October, affords sport of a variety unobtainable elsewhere; the surrounding grass and stubble fields are driven in, resulting in a mixture of grouse, black-game, snipe, partridges, golden-plover, and pheasants all put over the butts in the same drive. Then there are some comparatively small moors, notably one on Speyside, which yield driving bags out of all proportion to their acres: careful burning, conditions on contiguous moor, an abundance of "temporary" food, such as blaeberries (fruit and shoots), of which grouse (and also capercailzie) are inordinately fond, are contributory causes. Such moors can, in a favourable season, be driven many times without harm. And here it may be suggested that the number of days' sport which a moor can provide is to many occupants a matter of greater moment than the amassing of a huge bag on one individual occasion. A moor of 3,000 acres, sufficient for one day's driving, will no doubt produce more grouse under efficient driving management than the same area shot over dogs in three separate beats; but seldom will the former system afford as many days' pleasure as the latter. Thus a demand for space has arisen, to be satisfied by the merging of

several small moors in one large extent. Dogging moors are, by this process of evolution, restricted mainly to areas such as Caithness, Sutherland, Arran and other islands. In the "Long Island," where many years ago the stock was so carefully nursed as to produce, at Aline, a bag of 100 brace in a day, killed by the late Sir F. Milbanke, various causes, egg-stealing among them, have reduced the numbers to a low ebb. The supply of really good dogging moors has decreased more rapidly than the band of enthusiasts who demand them, and such moors are rarely in the letting market.

Given ample space, a first-class driving moor will provide sport for a succession of guests throughout the season, and in an exceptionally good year a stock will be left which may tax the spring food supply to the limit, even though the successive driving parties may have been composed of first-class shooters. Those moors already indicated as constituting "traps" for surrounding ground are especially liable to over-population in the spring if their supply of heather-seed is more plentiful than that afforded by contiguous and usually higher areas suffering from more adverse conditions of weather.

With a copious supply of young heather and a stock of grouse purged of the accumulation of old birds, recovery after a bad season is considerably quicker than was formerly the case in the absence of these conditions. An interesting example is provided by the "Grouse Chart" at Cawdor Castle, relating to some 28,000 acres of moor, now dealt with from Drynachan Lodge. In 1873 so clean a sweep had been made by disease that only 11 birds were shot: totals of 60 and 87 followed in 1874 and 1875 respectively, gradually increasing to 3,079 birds in 1878.

Again in 1902 the moor had suffered a wholesale depletion, and in that season and the one following 428 and 476 birds were the respective totals. But by 1907, again the sixth year of reckoning, the figures amounted to 10,048 birds.

In 1915 war exigencies permitted of only sixteen days' shooting, with an average of over 480 brace per day, while in 1922 the total bag was over 8,000 brace.

A little farther up the Findhorn, "fair stream of the alders," are the celebrated moors of Moy Hall, Meallmohr, and Daviot, on which area, 25,000 acres in extent, the 1922 total amounted to 9,700 brace. At Moy Hall the achievement of a 500-brace day as early as 1890 had proved the wisdom of Lord Walsingham's qualifying word "most" in his statement a year previously: "In most parts of Scotland the essential principles of driving are but little understood." [Badminton Library, 1889.]

In due course a bag of some 900 brace was placed to The Mackintosh's credit, curtailed by three drives unaccomplished and a resulting shortage of 300 brace, owing to dilatory tactics during the pick-up by some of the guests.

A compilation of records is not one of the objects of this chapter. Such matters have been exhaustively dealt with elsewhere—by Mr. Hugh Gladstone, for instance—but, as an indication that the aforesaid principles are not imperfectly understood in a locality far removed from the Monaliadh, the following extract from a personal game-book may be of interest sufficient to obscure the egoism involved in its quotation:—

"Aug. 30, 1911. Roan Fell. 8 guns. 2,523 grouse. 2 hares."

Roan Fell is in the Border country; some of the butts are 1,500 feet above the sea-level. One of the party was then an Eton boy who did good execution in a flank butt with his one gun. A wonderful day, undimmed in the retrospect by that haunting spectre, butts whom the war has robbed of their occupants.

One more quotation from the same book may perhaps atone for a tardy mention of a moorland district "ubi non Hymetto mella decedunt viridique certat bacca Venafro" (for surely no moors can vie with those of North Wales in splendour of heather bloom or profusion of blaeberry):—

"1912, August 13. Ruabon. 8 guns. 1,774 grouse."

Looking back on this day, its salient features seem to be the evenness with which the shooting was distributed along the line of guns, and the masterly manner in which the drivers were brought in by the head-keeper, a Perthshire man, mounted on a pony.

2. THE BLACK-GAME

Black-game afford but poor sport over dogs, the young birds being usually half grown and imperfectly feathered in the early days of the season. The parent hen is easily killed on 20th August; her sisters, free from family cares, are wilder, while the full-grown cocks, still in the moult, are for the most part hidden in patches of bracken, ashamed, as it were, of their tail-less extremities. They have an annoying habit of offering easy chances to the grouse shooter during the week preceding their own appointed date. It is a pity that our Game Laws do not make a distinction between the sexes, making 12th August the opening day for cocks and 1st September for hens. The latter date is sometimes urged as being early enough for both sexes, but the alteration here suggested would facilitate the killing of undesirable old cocks, and at the same time ought to satisfy the tenants of some shootings depending largely on black-game for sport, and whose excuse for untimely slaughter is that with them it is a case of early or never, the birds leaving their ground as soon as attracted by a change of food—for example, corn in the stook, or, later, wild berries. It is the "food migration" which too often exposes black-game to a double campaign, more noticeably since the moor-edge cultivation of oats has ceased to be an economic possibility. It is not surprising that black-game should be on the decrease, and yet they still exist in considerable numbers among surroundings quite other than ideal. In the "Ross of Mull," a promontory facing towards Iona, they appeared a few years ago to thrive admirably in birch and hazel scrub with a very small extent of arable land. The total absence of foxes here and on the island of Jura, whose wooded eastern shore holds a plentiful stock and ample wild food, is in their favour. Black-game in their infancy are delicate, and most attempts at hand-rearing them fail after a certain stage is reached. When these attempts are successful, the birds grow up delightfully tame. Even the wild broods suffer heavily from lack of insect food in a very dry summer.

The voracity of these birds when "on the stooks" is not to be lost sight of when planning drives, whose arrangement should be in the hands of one possessing intimate knowledge of their whereabouts, their feeding grounds from day to day, and their line of flight to and from that ground. Only a few drivers are necessary, the principle being to locate the birds and place the guns as near to them as is compatible with invisibility. Movement to shelter, whether of butts or stone walls, must be directed by stealth: black-game are credited with more cunning in avoiding the guns than they possess; it is often merely a matter of eyesight: a sentinel in a birch or thorn tree may have a view of the whole proceedings. A side wind is best, the cocks in full plumage particularly disliking a wind directly behind their tails, a position of affairs which they reverse as soon as possible. It is surprising how quickly so heavy a bird can turn and powerfully beat his way back out of the jaws of death. Wet, misty weather is in the sportsman's favour, not only by reason of reduced visibility, but also because a heavy indulgence in sodden corn induces lassitude, if not lethargy. A large number of guns is a mistake; three or four are more unostentatiously moved and placed. Many years ago, in 1874, two guns, one of them the owner of a domain containing the best black-game ground in Britain, killed 98 (81 of them cocks) in what was practically a half day, using one gun apiece. On another part of this estate, in one of those wonderful years, 247 birds (over 200 cocks) were killed by a party in one day.

Stalking black-game with a small rifle is a deadly method of killing off the cocks. When actually on the stooks they are replete, or intent on becoming so, and comparatively unalert. On the grassy "knowes" where, in early November, they resort to sun themselves and to indulge in their curious "pseudo-erotic" exercises, they provide sport of a high order. One intelligent man to move the birds when required is of assistance, as is also the observance of the rule to avoid shooting a bird in sight of another if it can be avoided. The report of a little ·250 with smokeless powder is less disturbing than the spectacle of a fluttering cock. This is an excellent method for securing good tails.

3. THE CAPERCAILZIE

To the circumstances already specified as conducive to the decrease of black-game must now be added the antipathy of the forestry enthusiasts in connection with their schemes for planting. It must be admitted that the presence of these birds in large numbers is difficult to reconcile with the prosperity of young conifers, and accordingly in certain areas, where replanting is in progress, black-game are likely to suffer heavily. This antipathy seems less reasonable in the case of capercailzie, whose weight requires the substantial support of older growth, though their power to damage very young plants from the ground is beyond question. Large blocks of old timber were necessarily sacrificed during the war, and the districts where capercailzie can be welcomed, or even tolerated, are correspondingly reduced. More is the pity, for "capers" certainly constitute a fascinating addition to many of those "rough" days whose results would without them be jejune; not even the red-grouse is more essentially a feature of his own landscape than is this primeval denizen of northern forests. The etymology of his very name is obscured by the haze of antiquity. Harvie Brown, in his interesting little monograph, accepts the derivation from "capull-coille"—that is, "wood-horse," or "horse of the branch." But "capull," not a very common word, signifies "mare," the usual Gaelic word for horse being "each." And, in any case, why horse? His love-song can scarcely be likened to a whinny. Risking the danger which proverbially attaches to a little knowledge, I would suggest "cabar-cailliach"[1]—that is, "witch or hag of the branch." There is certainly an element of the uncanny in the silent launch of so heavy a body and the glide across a valley at a speed which has taken the conceit out of many an accomplished sportsman. For the cock "caper" requires to be hit in the neck, where he is not less vulnerable than

[1] Anglicised "caillyach," hence "cailzie." The letters z and y shared one compartment in the old type-setter's tray; z was used when the supply of y's was exhausted. Compare Mackenzie, Menzies, etc., etc.

a blackcock: his breast might be "oak and triple bronze," so effectually does it repel a charge of shot. The hen, as a rule, flies lower, is less wary, and, except for a disconcerting trick of dipping to accelerate her flight, presents a comparatively simple and vulnerable target. Her sex, accordingly, is apt to figure too prominently among the slain, in the absence of orders to the contrary. Local knowledge is as necessary when planning a beat for "capers" as for black-game. Their local migrations, dictated by food supply, of which blaeberry shoots form an important item, will often depopulate the larger woods in favour of clumps or strips. Especially is this the case in early winter, and it is a pity to kill these fine birds before their plumage is mature. In driving such clumps or strips, the guns must be placed in the probable "passes" with the utmost caution, for some of the birds are sure to have a command of their surroundings from the trees: "capers," in fact, can be moved rather than driven.

In stormy weather they will often take shelter on the ground, from which the cocks especially rise with some difficulty and much noise. After the gale which devastated the woods in Perthshire and Forfarshire in November 1892, numbers of these birds were found crushed to death under the blown timber.

Whether the extinction of the capercailzie in Scotland prior to the year 1770, which seems to be generally accepted, was complete throughout the country, or merely confined to the regions under observation by gamekeepers, is a doubtful question. It must be remembered that in the last half of the eighteenth century parts of the Highlands were but imperfectly explored, and, though the days were past when "a cat could travel from Elgin to Kintail without descending to the ground," still clad with huge tracts of forest, of which the remains, preserved in peat, are tangible evidence. That the capercailzie was recognised as a bird of the chase before the days of firearms we may conclude from such sources as "The Lament of Ardgour," in which the mourner, enumerating the exploits of Donald the Hunter, indicates the very spot where "pierced by his arrow the 'cailzie cock fell." At any rate, the total disappearance of a bird not unduly or over-efficiently molested

(arboriculturists were few in those days) from surroundings which suited, and had suited for centuries, his habits and requirements, is impossible to explain and difficult to believe, especially in view of his rapid increase and spread since his reintroduction in 1837, an attempt on a small scale having failed nine years earlier. It is to be hoped that game preservers, in so far as the future may be destined to lie in their hands, will be "to his faults a little blind," and at any rate tolerate the presence of this characteristic aboriginal.

Seventy "capers" killed in a day, cocks being in the majority, seems to be the "record." Owing to the difficulty of bringing these birds over the guns with any degree of certainty, this figure would indicate the presence of a large stock.

4. THE PTARMIGAN

The ptarmigan is sadly wasted as a bird of the chase, owing to the fact that his existence in any considerable numbers is, with a few exceptions, confined to the highest ground in deer forests. As a sporting bird he undoubtedly possesses intrinsic value, his pursuit entailing qualities of a distinctly virile nature, such as ability to climb rocks and traverse loose and treacherous stone-beds with gun ever at the ready. In certain localities, such as the Grampian ridge, and many parts of West Ross-shire and of the Monadhliath range, the stock of ptarmigan is ample, in a favourable season, to provide sport for the young and active. But the best ptarmigan ground is often occupied early in the season by bands of stags which it is essential to leave undisturbed; when these bands break up, and stalking is in full swing, a day's promiscuous gunfire is out of the question. Nevertheless, on the Grampian deer-ground, largely consisting of hind-forests, very little harm would be caused by ptarmigan shooting judiciously carried out before the stags leave the sanctuaries. Even when these birds are left unmolested till the close of the stalking season in mid-October, bags of 40 brace and upwards are not difficult to obtain. In August a dog

is useful, provided he be a close ranger, and thus not readily "unsighted" on broken ground; but especially must he be proof against the temptation to "creep" in when the birds are running in full view before him, as will often happen, although, so closely do they harmonise in colour with their surroundings, the sportsman will have the greatest difficulty in distinguishing them on the ground. The recollection of five corpses secured after the discharge of a single-barrel 28-bore is still vivid, after nearly half a century, but to a boy of eleven such crimes may be forgiven.

Where circumstances connected with deer combine with a suitable configuration of the ground to make driving possible, it can be carried out with success and the charm attached to a form of sport so unusual. A ridge more or less isolated from other high ground, and intersected by a gully where the guns are placed, is ideal. Good results have been thus obtained at Corrour, in West Inverness-shire, particularly on the Ben Bhreac beat, where it has been proved that a careful observation of the birds' favourite alighting ground, so important in the planning of grouse drives, can be turned to equal advantage in the case of ptarmigan. In kindly sending me a description of the manœuvre, Sir John Stirling-Maxwell writes that "only two birds were killed before luncheon. Then we turned back to the top and moved a number of coveys which congregated in the usual way on a bunch of rocks. We tried a drive, which was a failure, but noticed that all the birds made for the Ulainich, a salient rock about 600 yards distant. We posted the four guns in a hollow, half-way between the two lighting-places, and I went with the beaters. We drove the same lot of birds backwards and forwards, and in quite a short time our bag had mounted up to 71 birds. It looked as if we might have gone on till all the coveys concerned were exterminated. I sometimes wish that we had, but one felt that it was getting rather brutal, though the birds gave splendid rocketting shots. I do not remember killing more than two or three with the beaters."

In 1907, again in the month of October, after stalking ceased, four guns killed 30 brace on Fersit Tops; but on most occasions, in spite

of the resource, observation, and organising ability of his head stalker, Duncan Ferguson (a victim indirectly of the war), to whom Sir John pays the highest tribute, "we have felt completely baffled by the behaviour of these simple-looking but really very artful birds." Chance sometimes takes a hand; for instance, in the case of a "short drive below a ridge of rock, above which we sat in the snow. The wind was blowing straight down-hill, and a good many of the ptarmigan making for the ridge were caught by the wind and shot as they fluttered back."

In the deer-stalker's mind the ptarmigan is associated primarily with those occasions on which he has been "held up" by the mist, blotting out his surroundings and rendering advance impossible. Harsh croaks and weird, jarring noises seem to surround him, and if he is armed with a catapult, a well-placed pellet of No. 1 will secure a variation in his diet, welcome in the absence of grouse. The flesh of the ptarmigan is dry; but to market-poachers is generally attributed his reduction in numbers, or, more accurately, his extermination in the more accessible districts which he formerly inhabited. The sale of ptarmigan during the close time is now confined to imported birds, by law and probably also by practice, for the poacher of ptarmigan in their modern haunts would consider himself but poorly requited for his toil. The stock is kept down by the hill fox and the eagle, the latter being the ptarmigan's worst enemy, able to pierce the wonderful camouflage designed for his protection. No less is the red deer his best friend, protecting by his own valuable presence their common sanctuary from the human intruder.

IV

NATURAL HISTORY OF THE GROUSE

[Capercaillie, Black-cock, Red-grouse, and Ptarmigan]

PRELIMINARY CLASSIFIED NOTES

[F. C. R. JOURDAIN. W. P. PYCRAFT. A. L. THOMSON]

CAPERCAILLIE [*Tetráo urogállus* Linnæus. Caper, cock of the woods, capercailzie, wood-grouse. French, *coq de bruyère*; German, *Auerhahn* (♂), *Auerhuhn* (♀); Italian, *gallo cedrone*].

1. Description.—The capercaillie may be distinguished at once by its great size and the rounded shape of the tail. There is no marked seasonal change of coloration, but the sexes differ conspicuously. (Pl. VIII.) Length, male 35 in. [889 mm.], female 25 in. [635 mm.]. The male has the head, hind-neck, inter-scapulars, and lower back black, powdered and freckled with grey, the scapulars and wing-coverts reddish brown, freckled with black. The primaries and their coverts are black, but the middle primaries have a patch of white at the base of the outer web, while the secondaries are reddish brown and tipped with white. The tail is black, with an irregularly marbled terminal band of white; the greater coverts black, tipped white. The feathers of the throat are black, and elongated, forming a "beard." Across the chest runs a broad band of dark metallic green, while the breast and abdomen are black, the feathers of the latter region more or less tipped with white; the flank feathers are grey, and white tipped. The beak is of a yellowish white. Above the eye is a fleshy "wattle" of vermilion, which becomes much swollen in spring. The iris is dark brown. The female can readily be distinguished from the grey-hen by the rounded form of the tail, which is traversed by broad black bars, the terminal bar being the widest, the triangular rufous patch at the base of the neck, and the white-tipped major coverts. The general coloration is of a rufous buff barred with black, but black predominates on the back, reducing the brown area on each feather to a narrow terminal band. The male in its first autumn differs from the adult in its smaller size and the absence of the white terminal tail band. The juvenile plumage,

in both sexes, recalls that of the female, but differs in that the wing-coverts and scapulars have buff shaft-stripes and the feathers of the body buff tipped. The young in down is buff coloured, with a black horseshoe on the forehead, the free end of the loop being continued backwards, above the eye; there are black mottlings on the sides of the head, nape, and neck, and an inconspicuous median, dusky stripe along the back. A narrow line of bare red skin runs from above the eye backwards and downwards to the aperture of the ear. [W. P. P.]

2. Distribution.—In the British Isles this species formerly inhabited the pine forests of Great Britain and Ireland. In Scotland and Ireland it survived till the latter half of the eighteenth century, but then became extinct. It was, however, successfully reintroduced in 1837 to Perthshire, and from thence has spread not only over the greater part of the Tay and Forth areas, but now ranges into Dee, Moray, Argyll, and Clyde, while stragglers have been recorded even from Wigtown and Dumfries in the south and Elgin in the north. (For a detailed account up to 1888 see J. A. Harvie-Brown, *The Capercaillie in Scotland.*) On the Continent it is found in the coniferous forests north to about 69°-70° in Norway and 68°-69° in Sweden, but in Russia it ranges to the Arctic Circle on the Petschora and 65° in the Urals. Southward its range does not extend beyond the Cantabrian Mountains in Spain, the Pyrenees, Alps, Dinaric Alps, Carpathians, and Balkans, and in Russia to the governments of Volhynia, Kieff, Tschernigoff, Orel, Tamboff, Penza, Simbirsk, Samara, and Orenburg. In the Volga basin, according to Buturlin, and also in Asia from the Urals to Eastern Siberia (lat. 65° on the Lena and Mongolia), it is replaced by allied forms. Throughout its range it is resident, confined chiefly to coniferous forests. [F. C. R. J.]

3. Migration.—This reintroduced species is resident, and, apart from range extension, stationary. [A. L. T.]

4. Nest and Eggs.—The nesting-site is generally in a hollow, scratched out by the hen at the foot of a tree in pine forest. Sometimes it may be found under the shelter of trees blown down by gales, in a low bush, or among thick heather, but these latter sites are unusual. Exceptionally nests have been recorded in a tree and in a falcon's eyrie. The hollow is usually lined with pine-needles, and occasionally a little moss or a few feathers, by the hen. (Pl. VI.) The eggs, as a rule, vary from 6 to 8 in number, but instances of 10 to 12 and even 14 and 15 have been recorded. In appearance they resemble those of the black-grouse, the ground-colour varying from yellowish to reddish yellow, generally with fine speckles of reddish brown, and spotted or blotched rather sparingly as a rule with sienna-brown.

Average size of 60 eggs, 2·27 × 1·62 in. [57·8 × 41·3 mm.]. Incubation is performed by the hen alone, and lasts about a month (Saunders). Mr. W. Evans states that 13 eggs hatched under hens on the 26th day. Laying begins towards the end of April in Scotland, and full clutches may be found from the second week of May onward, sometimes as late as early June, but only a single brood is reared in the season. [F. C. R. J.]

5. Food.—In spring the buds of various trees; in summer and autumn, ant larvæ and other insects, wild fruits and berries, acorns and grain; in winter, the shoots of Scotch fir and larch. The young feed on worms, ants' eggs, and insects, and are accompanied in their search by the female. [W. P. P.]

BLACK-GROUSE [*Lyrúrus tétrix* (Linnæus); *Tetráo tétrix* Linnæus. Blackcock (♂), grey-hen (♀), blackgame, heathcock; heathpoult (Devon). French, *coq de bruyère*; German, *Birkhahn* (♂), *Birkhuhn* (♀); Italian, *fagiano di monte*].

1. Description.—The blackcock may be distinguished at once by the peculiar lyre-shaped tail. The toes are scale-covered, and fringed on either side by a pectinate arrangement of horny processes. The sexes differ conspicuously in coloration, and the male shows an imperfect "eclipse" plumage. (Pl. IX.) Length 23·5 in. [585·46 mm.]. The plumage of the male is black, with a beautiful metallic sheen of steel blue. A bar of white crosses the wing, and the under tail-coverts are white. Above the eye is a large "wattle" of vermilion-red. The beak is black and the iris dark brown. The female (grey-hen) is distinguished from the capercaillie female by her deeply forked tail and smaller size. The general coloration is of a rufous buff, more or less heavily barred with black. In the male in "eclipse" dress (July-September) the black feathers on the head, and more or fewer of those of the upper back, are replaced by chestnut or brownish buff feathers barred with black, resembling those of the female, while the chin and throat are more or less white. These dull-coloured feathers are all that survive of a once complete "eclipse" dress. They are retained until the quills of the wing and tail have been renewed. The female may at once be distinguished from the female capercaillie by her deeply forked tail. Further, she is less conspicuously barred, the bars being much narrower. On the back, as in the capercaillie female, black predominates, reducing the buff area to a narrow-terminal band in each feather. The upper surface of the fork of the tail, when closed, has a "frosted" appearance. The juvenile plumage recalls that of the

female, but differs therefrom in having rufous buff shaft-streaks at the ends of the wing-coverts, scapulars, and inner secondaries. When about the size of a partridge, the males can be distinguished by the appearance of black feathers on the breast and abdomen, scapulars and interscapulars, and in the tail. The immature male resembles the adult, but differs in having less gloss on the plumage, and the feathers of the head and neck tipped with rufous, while the wing-coverts, scapulars, and secondaries are narrowly vermiculated with rufous. The young in down may readily be distinguished from the downy young of the capercaillie by the large patch of chestnut on the crown; further, a dusky median dorsal stripe may be distinguished running from the nape backwards to the middle of the back, where it broadens and becomes chestnut in hue. [W. P. P.]

2. Distribution.—This seems to be a diminishing species at the present time in the British Isles. In Devon and Somerset, though formerly plentiful, it is now much reduced in numbers, and almost extinct in Cornwall. In Dorset and Hants it is now very local and scarce, and in Wilts, Sussex, and Surrey, though occasional stragglers are still met with, it is probably extinct as a breeding species. In Wales it is very local and scarce, but still exists in Brecon and Montgomery, and also in some of the border counties (Hereford, Shropshire, etc.). On Cannock Chase (Staffs.) it is still common, and a few breed in N. Staffordshire and N. Derbyshire, and thence along the Pennine range to the Scottish border, ranging into all the northern counties of England. In Scotland it is unevenly distributed, but found throughout the mainland and many of the Inner Hebrides, but is absent from the Outer Hebrides and the northern island groups. Unsuccessful attempts have been made to introduce it to the Orkneys, Outer Hebrides, Lincolnshire, East Anglia, and several southern counties. In Notts, Leicester, and Kent it is now extinct, but may possibly survive in Worcester. It is not found in Ireland. On the Continent it ranges north to 70° in Norway and 68° in Sweden, while in Russia it extends to 69° in Lapland and 67° in the Urals. Southward it is found in the Urals up to 51°, and from the Samara and Saratoff governments to the Carpathians; it is scarce in Carinthia and Styria, but is found in the N. Apennines, the Alpine range and Savoie, though absent from the Pyrenees. Between these limits it occurs locally in open heaths and birch woods, especially in the Low Countries, Germany, and Denmark. In the Caucasus, the S. Urals, and in Asia east of the Urals from lat. 67° N. to Manchuria, it is represented by allied forms. [F. C. R. J.]

3. Migration.—Resident and stationary both in the districts in which it is indigenous and in those in which it has been introduced. [A. L. T.]

Photo by J. C. Crowley

Capercaillie on her nest

Photo by Howard Bentham

Capercaillie's nest and eggs

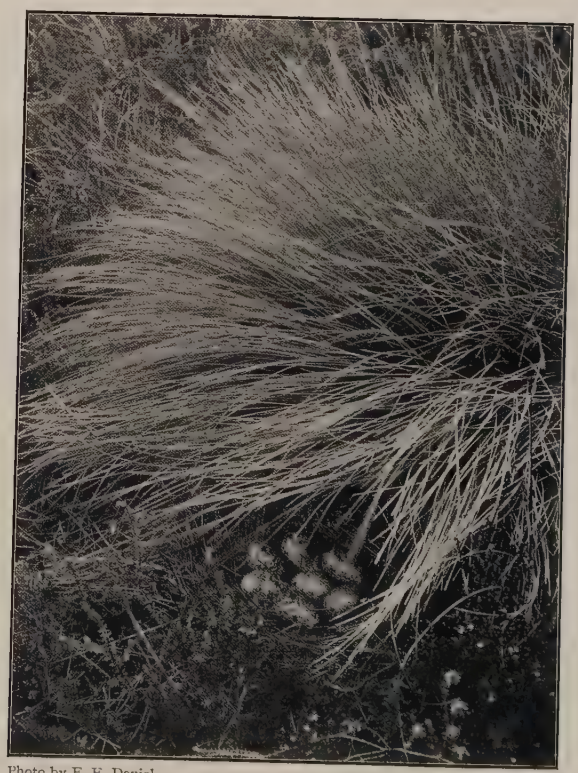

Photo by F. E. Daniel

Nest and eggs of red-grouse

4. Nest and Eggs.—A depression in the ground, sometimes in woodland, at other times in the open, is scratched out by the hen, and scantily lined with a few leaves, pine-needles, moss, and feathers.[1] (Pl. VII.) Here she deposits her eggs, usually 6 to 10 in number, though Mr. Gladstone records 12 and Dr. Westerlund 16 in one nest. The latter case would seem to be due to two hens laying in one nest. The eggs are miniature capercaillie's; yellowish white, sometimes with a distinct reddish tinge, sparingly spotted and blotched with yellowish red or orange-brown. Average size of 33 eggs, 2·0 × 1·45 in. [50·8 × 36·8 mm.]. Incubation, as this species is polygamous, is carried on by the hen alone. Mr. W. Evans gives the period as 25 days (under hen), 26th day from laying of last egg; Dr. Heinroth as 26 days, and Mr. H. S. Gladstone as 24 days. Full clutches of eggs may be found from about 10th May onward, and second layings in June and July, but only one brood is reared in a season. [F. C. R. J.]

5. Food.—The black-grouse is an omnivorous feeder, but shows preferences when they can be satisfied. In summer grass points, blaeberry shoots, and young heather-tops, ant larvæ and other insect food. In autumn heather, seeds of grass, and various rushes and sedges, grain, and turnips, and numerous berries and wild fruits, such as cranberries, blaeberries, wild strawberries, and rowan-berries. In winter and spring the shoots of larch and Scotch fir, and birch buds are greedily eaten. The young feed chiefly on insect food, and are accompanied in their search for food by the female. [W. P. P.]

RED-GROUSE [*Lagópus lagópus scóticus* (Latham).[2] Moorgame (Lancs.); heathpoult; red-game, muir-fowl, gor-cock (Scotland). As this species is unknown in France and Italy, there are no popular names for it in those languages; German, *Moorschneehuhn*].

1. Description.—The red-grouse may always be distinguished by the blackish brown colour of the remiges, the feathered toes, and the absence of pectination along their margins. The sexes differ, and there are marked seasonal changes of coloration. (Pl. X.) Length 15·5 in. [393·7 mm.]. The general coloration in both sexes shows an unusual range of variation. A typical male in its "breeding" dress is

[1] A nest has been recorded in a tree by Mr. H. S. Gladstone (*Birds of Dumfriesshire*, p. 322).

[2] Strictly speaking, as only one form of red-grouse is found in our islands (though the willow-grouse has been recently introduced) binomials should here be used for this bird, but as this might cause confusion with the Scandinavian willow-grouse, *L. lagopus lagopus* L., the distinguishing trinomial has been added.

of a dark chestnut-red, barred with black, somewhat coarsely on the crown, finely over the back and chest. The breast is blackish. At the beginning of June an "eclipse" dress is assumed, to be shed in October, when the remiges and tail feathers are also renewed. The general hue of the "eclipse" dress is black, irregularly barred with golden buff, but the under parts remain unchanged—in the "breeding" dress—till the autumn moult. The female in her "winter" dress, assumed in August, resembles the male, but may generally be distinguished in that her head and neck are more or less conspicuously barred with black, while in the male such markings are less inconspicuous. The breeding dress of the female, assumed during March and April, and answering to the "eclipse" dress of the male, has the feathers of the upper parts black, on the crown barred and tipped with golden buff, on the hind-neck with an interrupted marginal band of golden buff. The scapulars and inter-scapulars are of a golden buff, with the central area of the feather black and marked by one or more spots or short longitudinal lines of golden yellow, but many of the scapulars have the central black area marked by obliquely transverse bars of golden buff. The feathers of the fore-neck and prepectoral region are margined with golden buff. In some feathers the enclosed black area is marked by one or more longitudinal lines of golden buff, and in others the black area is transformed into black bars on a ground of golden buff. The flank feathers are yellow with broad transverse bars of black. The central area of the breast retains the red feathers of autumn dress. The juvenile dress resembles that of the adult female in her "breeding dress," differing therefrom chiefly in that the yellow markings on the back feathers are arranged concentrically; the forebreast and flanks are of a golden buff with a subterminal bar of black, and a black bar across the centre of the feathers, while the breast and abdomen have a typically mesoptyle plumage of greyish yellow feathers, barred with dark grey, and showing that the whole plumage is of the mesoptyle generation. The young in down recalls that of the nestling blackcock, having a patch of chestnut on the crown, which is, however, darker in hue, shading into sepia at the periphery.

Having regard to the great importance attached to the plumage phases of the red-grouse, the following condensed summary has been compiled from notes generously furnished by my colleague, Mr. W. R. Ogilvie-Grant. Briefly he recognises in the male three types: a red, a black, and a white-spotted. (1) *The red type.* General coloration of a rufous chestnut, wherein white marks on the breast are conspicuous by their absence. Birds so coloured are obtained from the western counties of Scotland, England, and Wales, the Hebrides, and the low grounds of Ireland.

(2) *The black type.* Not a sharply defined type, and is rare. Almost wholly black specimens have been obtained from Caithness, Sutherlandshire, Perthshire, Stirlingshire, Dumbartonshire, and Yorkshire. As a rule these black types are represented by abnormally dark specimens of the red or white-spotted forms. (3) *The white-spotted type.* Feathers of the breast and belly, sometimes of the head and upper parts, tipped with white. The most typical examples of this type are from the high grounds of the north of Scotland, and are certainly most characteristic of the Highlands.—In the female no less than five types are distinguishable: red, black, white-spotted, buff-spotted, and buff-barred types. (1) *The red type.* This is relatively rare among females, and occurs over the same geographical range as in the case of the male. (2) *The black type.* As rare in females as in males, and occurs in the same geographical areas as in male. (3) *The white-spotted type.* As in males; is most commonly met with in the Highlands. (4) *The buff-spotted type.* This is the commonest and typical form of coloration in the female, the feathers of the upper parts being spotted at their tips with white or pale buff. (5) *The buff-barred type.* Characteristic of birds from Ireland. Herein the upper parts are coarsely barred with buff and black, and the female in autumn plumage resembles the typical female from Great Britain in breeding plumage. In such birds the plumage presents no appreciable change of coloration throughout the year. The significance of these variations yet remains to be discovered, but they seem to be due to climatic influences. Variations in weight are no less marked. The heaviest birds are said to be those from the moors of Caithness and the south of Ireland, birds from these areas turning the scale at 2 lbs. each. A male from Kerry, recorded by Messrs. Ussher and Warren (*Birds of Ireland*), turned the scale at $2\frac{1}{2}$ lbs., but this is a quite exceptional weight. The average weight is $1\frac{1}{2}$ lbs.; females are always rather smaller and lighter. [W. P. P.]

2. Distribution.—This British form is confined to Great Britain and Ireland, but has been successfully introduced into North-west Germany, near the Dutch border, and also to South Sweden. In Scandinavia, North Russia, Siberia, and North America it is represented by allied forms. In England it is found on the Welsh borders (Monmouth, Hereford, and Salop), and from Staffordshire and Derbyshire northward on moorlands to the Scottish border. It has long been extinct in Leicestershire, but has been introduced to West Suffolk, and unsuccessfully to the south of England. In Wales it is general in the north, though absent from Anglesey, and is also found, though less commonly, in the South Welsh counties. In Scotland it is plentiful, owing to careful preservation, throughout the mainland

and on the Western Islands, and is also common in the Orkneys, but introductions to the Shetlands have not been successful. In Ireland it is resident on the mountains and the bogs of the central plain, but is not numerous; and in the Isle of Man, where it had become extinct, has recently been reintroduced. [F. C. R. J.]

3. Migration.—Resident. Except that the higher grounds are vacated in winter the species is quite stationary. Examples occasionally occur at some distance from their usual haunts, especially in severe weather, and have even occurred at some of the Irish light-stations (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 230). [A. L. T.]

4. Nest and Eggs.—The nest is a mere hollow among heather, ling, or rough pasture, scantily lined with dead grasses and moss, and sometimes a few heather twigs, and is the work of the hen bird. (Pl. VI.) The number of eggs usually varies from 7 to 12, but instances of 13, 14, 15, and even 17 have been recorded, though the last at any rate was almost certainly the produce of two hens. The ground-colour of the eggs varies from creamy to light reddish white, and they are profusely blotched and spotted all over with deep red-brown, sometimes when fresh almost blood-red, and at other times blackish brown or brownish. The colour is very easily rubbed off when the eggs are first laid. Average size of 36 eggs, 1·79 × 1·25 in. [45·5 × 31·8 mm.]. Incubation is performed by the hen alone, and lasts for 24 days according to Mr. H. S. Gladstone ; an egg hatched in an incubator on the 24th day (W. Evans). Exceptionally nests have been found in February and March, but the usual date is about the third week in April in the north of England, and a week or two later farther north. Only one brood is reared during the season, though a second clutch is deposited if the first is destroyed. [F. C. R. J.]

5. Food.—Mainly the young shoots of heather and ling, and when these plants are not found, the shoots and fruit of the crowberry (*Empetrum nigrum*). In the autumn the seeds of sedges, grain, and wild fruits and berries. The young feed on flies, caterpillars, and other insects, and the shoots of grass and heather, and are accompanied in their search for food by both parents. [W. P. P.]

PTARMIGAN [*Lagópus mútus* (Montin). Rock-partridge, white-partridge. French, *perdrix blanche* ; German, *Alpenschneehuhn* ; Italian, *pernice bianca*].

1. Description.—The ptarmigan may always be distinguished by the white remiges, and the outer tail feathers, which are black, with white bases and white tips.

Photo by J. C. Crowley

Greyhen on her nest

Photo by J. C. Crowley

Ptarmigan on her nest

The sexes differ, and there are three seasonal changes of coloration. (Pls. XI., XII.) Length 14·5 in. [368·3 mm.]. The male, from April to July, has the upper parts and flanks black, more or less finely mottled and barred with grey rusty colour on the back, rump, and upper tail-coverts; the chin and throat are white; the fore-part of the breast is brown, sometimes slightly mottled with rufous, and the rest of the under parts are white. The remiges and outer wing-coverts are white, tail feathers black, tipped with white; above the eye is a large "wattle" of vermilion. From August to October the upper parts are grey barred and vermiculated with black and white; a few of the black feathers of the summer dress in the scapulars may give a blotched appearance to this region. The black of the lores is wanting. The throat and sides of the head and neck are more or less white, barred with black, while the greater part of the wings and the whole of the breast and abdomen are white. The flanks are grey barred and vermiculated like the back. In the winter dress, worn from November to March, the whole plumage is white save for the black lores, a black stripe behind the eye, and the black of the tail feathers. The female, in breeding dress (April to July), differs from the female red-grouse at the same season in that the upper parts are irregularly spotted and barred with buff and white. The flanks are of a golden yellow, coarsely barred with black, while the wings are mostly white. The middle pair of tail feathers are black, barred with rufous, harmonising with the rest of the plumage of the upper parts; the remaining quills are black, more or less tipped with white as in the male, and often with a more or less extensive area of white at the base of the tail. In July the light edges of the feathers of the upper parts become abraded and faded, making the plumage darker than in May. The "wattle" above the eye is much smaller than in the male, and the bill is black. In her autumn dress (August to October) she is to be distinguished from the male by the presence of more or fewer of the black feathers of the summer dress. The middle pair of tail feathers are usually sandy brown, mottled with blackish, and tipped with white; in some birds one or both feathers may be pure white. In both male and female the feathers of the legs and toes are moulted and renewed between June and September, and the claws are also shed, as in the red-grouse. The female in winter dress (November to March) differs from the male in having no black on the head. In the juvenile plumage the head, upper parts of the body, chest, and sides are black, barred and mottled with rufous buff, most of the feathers having a whitish spot at the tip. The scapulars are black, with a round white terminal spot bounded on either side by a bar of ochreous yellow, while the middle of the feather is traversed by yellow chevron. The primaries are

brownish black, mottled with buff on the outer webs. The rest of the under parts whitish, obscurely barred with dusky. The tail feathers are black, irregularly barred and mottled with buff. After the next moult they differ from the adult only in that the outer primaries have blackish markings along the terminal part of the shafts. The nestling in down resembles that of the red-grouse, but differs in having the crown sepia coloured instead of chestnut with a sepia border. Posteriorly this somewhat diamond-shaped cap is bounded by conspicuous patches of light buff. [W. P. P.]

2. Distribution. — In the British Isles the ptarmigan is confined to the mountains of Scotland at the present time, though apparently it formerly existed on the fells of the Lake District. Till about 1822 it survived on the high ground of Dumfries and Galloway. It is believed to be now extinct in the Outer Hebrides, though still found in Mull, Islay, Jura, and Skye. On the mainland from Ben Lomond northwards it is found on all the mountains over 2000 feet in height east of the Caledonian Canal. In W. Ross it is plentiful, but seems to be disappearing in W. Sutherland and Caithness (Millais), and is extinct in the Orkneys. Unknown in Ireland. On the Continent the ptarmigan is resident in Scandinavia, south to lat. 58½° in Norway, and Dalecarlia in Sweden. In N. Russia it is found north to the shores of the Arctic Ocean and south to 67° in Lapland and 61° in the Urals. It also occurs in the whole Alpine range, ranging into the Tyrol, Styria, and Carinthia, and also in the Pyrenees and Navarre, but apparently not in the Cantabrian range. In Greenland, Iceland, Spitsbergen, Arctic America, and Arctic Asia it is represented by allied forms. [F. C. R. J.]

3. Migration. — Resident: changes of altitude—a species of "vertical migration"—are the only seasonal movements. [A. L. T.]

4. Nest and Eggs.—The breeding-grounds of this species in Scotland lie much higher than those of the red-grouse, usually between 2000 and 4000 feet, where there is little vegetation but mosses, hepatics, stunted heather, and other moorland plants. A depression is scratched out by the hen, and is usually unlined or only very scantily furnished with fragments of moss and ling and feathers from the sitting bird. (Pl. VII.) The eggs are 7 to 12 in number, but usually 8 or 9. They resemble those of the red-grouse, and in some cases are indistinguishable, but as a rule the ground-colour is whiter, the markings more sparingly distributed and blacker, with less of the rich deep red-brown so often found in the eggs of the red-grouse. Average size of 35 eggs, 1·70 × 1·2 in. [43·18 × 30·7 mm.]. Incubation is carried on by the hen alone, who is a very close sitter. The period, according to Mr. J. G. Millais, is

nine days longer than that of the red-grouse. Naumann gives it as three weeks, but not from personal observation, and it is probably on account of the greater cold at higher elevations that it differs from that of the red-grouse. In Scotland laying begins about 20th May, and the clutches are complete about the beginning of June. When the first layings are destroyed by heavy snowfalls or by vermin, eggs may be found late in June or in July, but only one brood is reared during the season. [F. C. R. J.]

5. Food.—The shoots and fruits of Alpine plants, especially of blaeberry, blackbear-berry, and small red cranberry; these form the staple diet. Small plant leaves and lichens, especially of the "reindeer-moss," *Cladonia rangiferina*. The young feed on young grass shoots and blaeberry leaves broken up by the parents, and are accompanied in the search for food by both parents. [W. P. P.]

THE GROUSE SUBFAMILY

[W. P. Pycraft]

Of the birds which come under this heading we know more, as regards their life-history, perhaps, than of any other of our native avifauna, though, curiously enough, much that would be supposed to be common knowledge among sportsmen is yet known only to a relative few, whose interest in their coverts does not begin and end with the shooting season. To them we look for aid in revising what has already been recorded, and in filling the many gaps in our knowledge, more especially of what takes place during that period which falls within the "close season." And what takes place during this time can only be discerned by the most careful and laborious observation.

Few birds display a greater power of adaptability to environment. For save that none have become aquatic, there are few places on the earth's surface where, in one guise or another, they do not thrive: they are at home alike on the burning desert, in the jungle and the gloomy forest, or amid the snow-covered heights of the mountains. Yet whatever may be their climatic environment, the nature of their covering is the same. That is to say, those which live, for the most part of the year at any rate, amid the snows are clad no more thickly than those which live where snow can never fall, for no game-bird ever develops an under-covering of down feathers, though ptarmigan and willow-grouse have feathered legs and toes; but so also do many birds which, so far as we can see, have no need of such investments.

In all that concerns the continuation of the species they display every possible difference. For while some are monogamous, more are polygamous. None, however, lay double-spotted eggs, and all have precocious longitudinally striped young. These afford a striking contrast with the precocious young of, say, the Anatidæ. And this

because the power of flight is developed within a few hours after birth, and long before contour feathers make their appearance on the rest of the body. With the Anatidæ the reverse is the case, the wings remaining ridiculously small and downy till the rest of the body is feathered. These differences, of course, are intimately related to the struggle for existence, and will be considered at greater length anon.

In the matter of coloration and ornamentation, and in their behaviour during the troublous period of courtship, they display an almost inexhaustible variety.

The wings in all are of a rounded shape, thus, though capable of a high rate of speed, the flight is generally not continued far, though some species are migratory. But even these are birds of relatively poor flight.

Fortunately for us, the game-birds of these islands afford us information on every one of these varied aspects of life.

But for the keenness of the sportsman, the largest, if not the handsomest, of our game-birds, the capercaillie, would long since have disappeared from among us, and this because the original wild stock which formerly tenanted the pine forests of the British Islands became exterminated, in England and Wales at some remote period, of which no record remains, and in Scotland and Ireland during the second half of the eighteenth century. But in 1837 it was re-introduced from Sweden into Perthshire, and from thence has now spread over the central districts as far as Loch Lomond, East Stirlingshire, and Fife, Aberdeen, Inverness, and north to Elgin. To-day, probably because the areas of coniferous woods have proved too restricted for the increased population, they have spread into coverts which consist largely of oak and birch. And in this extension of range, in the search for unoccupied breeding territory, be it remarked the females precede the males by one or two years. Thus, lacking males of their own species, they often breed with the blackcock.

The latter species presents a similar story, inasmuch as, though never at any time exterminated, its range, as has already been shown (p. 76), was once more continuous than now over these islands.

In appearance these two birds have much in common, but the blackcock is much the smaller, and, in the opinion of most, he is also handsomer, the curious lyrate tail contributing much to this superiority. But to this aspect we must return later. For the moment, let us compare the habits of the two species.

The capercaillie, as we have already remarked, prefers large woods of larch, spruce, and Scotch fir, and for preference, those on a hillside, when, on fine days, the birds delight to sit on the tops of the trees to enjoy the morning sun. The blackcock, on the other hand, annexes the rough and broken heather, gorse, and marshy land adjoining pine and birch forests, and intersected by mountain streams.

In the case of both species, however, the inclement weather of the winter months drives them from their favourite haunts. The capercaillie, from October to April, according to Mr. Millais,[1] seeks the shelter of the low-lying woods of birch, pine, and larch, or forages among the deep heather beyond its confines, and the corn-fields still farther afield, to rob the stooks, and gather the abundant harvest of blueberries and raspberries afforded in such regions. During more severe weather they will readily eat the shoots of the Scotch fir, on which account this bird in many parts of Scotland is detested, since, by nipping off the leading shoot, large numbers of good trees are spoiled, at any rate as to shape. So great is the animosity it inspires on this account, that in some forests the bird is shot at sight, and its eggs stamped upon whenever they are found. The birds seem almost to realise the existence of this ill-will, since they feed at such times stealthily, the hens alone making any sound—uttering a low "*coq coq*" as they step along the branches and reach for the points, which they nip off with a jerk of the head.

[1] J. G. Millais, *History of Game-Birds.*

The descent to lower levels, on the part of the capercaillie, at the end of the autumn, however, is not universal, for it would seem the old males but seldom forsake the high ground, while, on the other hand, it is not uncommon for an odd male or two, and a few females, to remain on the lower ground to breed.

Mr. Ogilvie-Grant's account[1] of the capercaillie, while confirming that of Mr. Millais, omits any direct reference to these seasonal movements from the higher to lower ground, though they are perhaps implied in his remarks. It is a bird, he says, of the pine forests, and spends the greater part of its time in the branches, feeding on the tender shoots of spruce and larch, but it is fond of various ground fruits, in search of which it wanders to comparatively open country, far from woods, and displaying a great liking for grain, visiting the stubbles in fine weather.

There is a puzzling discrepancy in the accounts which have been rendered of the habits of black-game, even in the records of those who, both as ornithologists and sportsmen, must be regarded as authorities on this subject; a discrepancy perhaps traceable to differences of behaviour due to local conditions which have escaped the notice of the authors of these records. No useful purpose would be served, even if our space permitted, by collating all the varied statements which have been made on this theme; it must suffice to take the evidence of the three men best qualified, perhaps, to speak as to the life-history of the game-birds of these islands—Mr. Abel Chapman, Mr. Ogilvie-Grant, and Mr. Millais. According, then, to Mr. Chapman, black-game assemble into parties about the end of September. These packs, from a dozen to fifty or one hundred strong, "cocks and hens together," may at this season be readily detected, being always, whether resting or feeding, in the open; since now, having finished their moulting, they disdain concealment. During October they abandon the higher moorland and resort to lower grounds adjacent to tillage, haunting the stubbles, and feeding

[1] W. R. Ogilvie-Grant, *Lloyd's Natural History: Game-Birds*, vol. i.

largely on heather, hips and haws, buds of birch and alder, and the various plants which grow on old grass land. By the end of the month, however, it would seem that, in Northumberland at any rate, these birds return to their old haunts on the high moors, where, during November and December, they seem to be met with in large packs, choosing some flat-topped ridge whereon patches of short, sweet grass and heather are found. Heavy rains, gales of wind, and deep snow, it is to be noted, affect them less than is the case with grouse, as we shall presently show. They seem under such conditions to seek the lower wooded valleys and to shelter in the trees, perched like rooks on the bare birches and hawthorns, and feeding on haws and buds.

Mr. Millais seems to incline to the belief that the sexes, when "packing" in September, separate, the old males at any rate living apart from September to March: indeed he goes further, for, in another passage in the account to which we are referring, he remarks that the males normally live apart from the females, keeping together throughout the summer in small parties, "'even' in July and August when in eclipse"—the season most of all when one would imagine they certainly would seek seclusion. But whether the packs are mixed or not, they do not apparently change their quarters, according to this author, till compelled by "the first fall of snow," when they forsake the fringe of the moor for the deep heather found in the birch and rowan area, in which sparse cover indeed, it seems, a few birds may be found the year round. As a rule, he says, black-game avoid heavy timber, seeking shelter therein only during exceptionally prolonged hard weather. And he, as it were, clinches this point by remarking that as a rule they roost on the ground, but occasionally in trees.

One gathers from this brief sketch, and from Mr. Abel Chapman's account, that the blackcock is not partial to woods. Yet Mr. Ogilvie-Grant, who may certainly claim to have a fairly intimate first-hand acquaintance with this bird, tells us that it is a denizen of the woods

Capercaillie; male in front

By G. E. Lodge

—pine and birch forests—spending most of its time amid the branches, and roaming to the open moors and stubble to feed, gathering on the latter in enormous flocks, morning and evening.

Whatever may prove to be the cause of the discrepancies in the published records of the habits of the black-grouse, it is clear that it possesses greater powers of adaptability than is displayed by the capercaillie, and hence the more restricted range of the latter.

What is true of the blackcock in this matter of adaptability is true also of the grouse, or, to be more exact, of the red-grouse, though its chosen environment differs. Wherever heather and ling flourish, from the sea-level to the rock-strewn summits of the highest moorlands, there may grouse be expected, for such plants furnish their favourite food. But, be it noted, there are large areas in Scotland, England, and Ireland where these birds also thrive, though they must depend for food throughout the greater part of the year on grass and rush seeds, and the leaves and fruits of the common crowberry (*Empetrum nigrum*); but when the autumn comes they feast riotously on grain gleaned on the corn-fields, and on all wild fruits within their reach, especially blueberry, blackberry, cranberry, and cloudberry.

As might be supposed from the extent of their vertical range, grouse suffer much during the later autumn and winter months when these happen to be visited by unusually severe weather. Roaming about in small packs of both sexes, broods of the year or females alone when the weather is open and mild, gales or heavy snow speedily effect a union of the scattered packs, followed, in the case of the birds haunting the higher ground, by a migration to the more sheltered valleys. Here, even if there be heavy snow, they contrive to find a living, but only if the winds be high enough to blow the snow into drifts, leaving bare patches, whence food can be obtained. When the snow lies deeply, and uniformly, from lack of wind, or snow followed by a partial thaw and renewed frost, locking up all food, they speedily feel the pinch of hunger, and then migrate for great distances, travelling in immense packs. Such an exodus, Mr. Millais

tells us, took place in Northumberland during the winter of 1884-85. "All food was frozen," he remarks. The grouse soon accepted the conditions before it was too late, and gathered in thousands on the heights of Simondside, and from thence passed in immense packs across the Coquet to the sheltered moors about Cragside. During the severe weather of 1886 and 1895, again huge packs were driven to the low country, where they fed on corn, turnip leaves, buds, and hedge-row fruits, many perching on the hedges and the lower boughs of trees, such as thorn and rowan, to secure the berries still left. The behaviour of grouse during these bursts of inclement weather seems to be just what we should expect. This being so, it is the more remarkable to find another ornithologist, and one who speaks with authority, giving an account of the behaviour of grouse during heavy snowfalls which is utterly at variance with that of Mr. Millais, and seems, further, to be outside the experience of other ornithologists whom I have consulted. I refer to that of Mr. Abel Chapman,[1] who tells us that within twenty-four hours after a heavy fall of snow the grouse indeed disappear, but they are underneath it, having constructed a "perfect network of burrows—most nearly resembling a rabbit warren. You may have seen from afar—or you may not—just the head of one grouse, the sentry on guard. Quite as often this precaution is neglected, and a whole pack will be asleep in their burrows, secured, they imagine, by the miles of snow-fastnesses that surround them." This habit, of instantly burrowing beneath the snow as soon as it is deep enough, Mr. Chapman holds, is a survival from times when winters were more severe than now, and he reminds us that it is the invariable practice of the nearly allied rock ptarmigan, *Lagopus hemileucurus*, in Spitsbergen, which enjoys but four months of life in daylight and aboveground, the remaining eight being perforce spent in snow-burrows and tunnels in the dark. In the Arctic and Scandinavia, he writes, "Nature has organised a beautiful provision to meet these cases. For the earlier autumnal snows fall soft and

[1] *Bird-life of the Borders*, p. 263.

light, easy of excavation, and are, in fact, already ramified in every direction with grouse-burrows and tunnels long before that subsequent stage when severe frosts shall have indurated its substance and steeled its surface. Beyond that, the grouse have here provided, not merely a winter home, but—more important still—a full winter's stock of provisions. For these early autumnal snows hold enclosed within their soft and easily excavated recesses the whole abundant crop of Arctic wild fruits and berries, 'preserved' for the birds' winter needs, and guarded by the frost-steeled roof above against risks of decay." But when strong winds sweep clear the weather slopes of the hills, he remarks, grouse stay aboveground, gathering in large packs to feed on the heather swept clear of snow. Thus, according to Mr. Chapman, there is little or no migration takes place as a consequence of inclement weather; the birds adapt themselves to the prevailing conditions—where snow falls deep they burrow, where it is blown into drifts, leaving bare places, they stay and make the best of it. Be this as it may. it reveals a discrepancy in observation of one of our most jealously guarded birds which is difficult to account for, and seems to show that those who are most zealous in their slaughter are least interested in their mode of life! It does not seem possible that Mr. Millais and Mr. Chapman can both be right. What, then, are the facts of the case? That such a question should have to be asked to-day is astonishing. Yet there are many who gravely assure us that there is nothing more to be learnt about British Birds!!

The curious, and apparently almost unknown, burrowing habits described by Mr. Abel Chapman in the case of the red and willow-grouse naturally lead us to ask, What of the ptarmigan in this respect? If no mistake has been made in regard to the two first-named species, the last, one would imagine, would certainly also elect to spend the winter months in a similar retreat. Yet I have been unable to find any records of such fact. Heavy snowstorms unaccompanied by wind, resulting in a uniform mantle of deep snow cutting off their food-supply, will drive them to lower levels. If there be wind, exposing

patches of ground whence food is obtainable, no migration is necessary. Where the snow forms but a loose covering, not too deep, the birds, Mr. Millais tells us, will burrow therein for food, while in Norway they often follow the reindeer and dive into the holes made by the deer in scraping up moss with their feet, thereby securing the ice-preserved berries. Save, indeed, when it is abnormally deep, snow has no terrors for them, as is shown by the fact that they roost thereon nightly. At such times they preserve a scattered formation, unlike the grouse and the partridge, which sleep close together. These roosting-holes are easily discovered by the pile of dark droppings left therein. Similarly Seebohm[1] remarks of the capercaillie that it "generally roosts in trees, but in severe seasons it will seek shelter from the cold by burrowing into the snow." But there is in these cases no burrowing and tunnelling such as Mr. Chapman has described in the case of the rock ptarmigan.

If, however, the weather becomes unusually severe, then a general and extensive exodus becomes imperative. Their more extended wanderings however, in Scotland at any rate, are implied rather than observed. And this because such journeys are performed at altitudes too high for observation. But the fact that high mountains known to have been the resort of large numbers of ptarmigan have been found suddenly deserted, while distant mountains under less severe climatic conditions—but on which the stock had been reduced to the vanishing point—have been found "alive" with birds, leaves little doubt as to the interpretation to be placed on the phenomena. On the Continent, however, and in N. America—in the case of the doubtfully distinct rock-ptarmigan—migratory movements on a large scale have been observed, in Labrador extending over several hundred miles.

In varying degrees, then, capercaillie, blackcock, and red-grouse all migrate to avoid stress of weather, or rather to secure food. And the same is true also of the ptarmigan. But, living in regions where

[1] Seebohm, *British Birds*, vol. ii. p. 442.

vegetation is at all times scanty, it is a matter for comment indeed that it contrives to secure a sufficiency even during the plenty of summer and autumn. Heather and ling, and the birch and conifers, which so largely supply the needs of the former birds, grow at lower altitudes than the ptarmigan frequents, and still more remote are the bounteous fruits of autumn furnished by the corn-fields. The fruits and leaves of alpine plants, and the fruit and leaves of blaeberry, blackbear-berry, and small red cranberry, form their staple diet: when these are to be had in plenty, indeed, they will eat nothing else. Insects during the summer furnish a welcome variety. True, Naumann[1] assures us that ptarmigan eats the buds of birch and other trees, and the needles of conifers, but these statements need confirmation, as also does the statement of Mr. Howard Saunders that the tops of ling are eaten.

That the conditions of existence at these high altitudes are severe, and that this bird is not able to adapt itself readily to new conditions, is shown by the fact that its range is steadily decreasing in Great Britain. It seems never to have inhabited Ireland, and its supposed occurrence in Wales in times past is doubtful. Long since it occurred on the fells of Westmorland and Cumberland, but is now entirely confined to Scotland (see p. 82). There also its range has diminished, and is diminishing. It would seem, as we have suggested, that the ptarmigan is lacking in plasticity, and is in consequence unable not only to extend, but even to maintain its range. The curiously specialised nature, the inherent inability to adapt itself to new conditions, which the ptarmigan displays, make the avoidance of its enemies a difficult matter. Its chief foes are the golden eagle and the hill fox. But of late years a new enemy has arisen in the common and other gulls, which make merciless raids upon its eggs. Against

[1] Ptarmigan shot in Norway contained in crop leaves of birch and sallow, and tops and berries of crowberry. Dwarf birch and sallow crawl about the rocks like ivy on the high ptarmigan ground in Norway. Willow-grouse shot in same district contained whortleberry (blaeberry) leaves and berries, also leaves and young catkins of birch, and a few heather tops (species of heather not noticed). [W. R. Ogilvie-Grant.]

the eagle it is largely protected by its plumage, which at all times of the year bears a marvellously close resemblance to its surroundings, but the fox and the gull cannot so easily be avoided. During the winter months, indeed, the eagle commonly seeks its quarry at lower levels, finding it even more difficult to see its feathered victims amid the snow than amid the barren rocks during the summer. That they hold the eagle in great dread is shown by Mr. Millais, who tells us that on hills where they are subject to constant alarms from this bird they are always very wild. Thus it is not surprising to find that natural selection has been vigorously at work eliminating all but the largest winged birds. For its size, indeed, the ptarmigan has the largest wings of any of our game-birds. Thus they can ascend and descend perpendicular slopes of several hundred feet at great speed, and without apparent effort. Even young birds, no bigger than the thrushes, Mr. Millais tells us, can do this. To escape the swoop of their powerful enemy they will sometimes take a sudden dive and a swing towards the rocks, conforming precisely to the contour of the mountain, and in this way completely evade capture. Another factor in determining the size of the wings is the need for migration to escape the rigours of exceptionally severe weather. But on this head enough has already been said.

We must turn now to the subject of coloration and plumage changes, which, though it does not, strictly speaking, fall under the head of habits, is closely connected therewith, and is, moreover, of such exceptional interest that it demands exceptional treatment. The males of the capercaillie and the blackcock are strikingly dissimilar, even though they have much in common. The females, on the other hand, differ conspicuously from their mates, and much more nearly resemble one another than do the males. Thus we may infer that originally both sexes, when adult, were coloured like their respective females, as they are still when in the juvenile plumage. That there is weighty evidence in support of this assumption is

exhibited at any rate in the case of the blackcock; for this bird, be it noted, for a short space annually exchanges the brilliant metallic blue of the head and neck for the similar dull hues of the female. Just, in short, as the head and neck are the last to lose the down feathers, so also they are the last to lose the earlier, ancestral, brown livery, which elsewhere on the body has become eliminated. These brown feathers are worn during the months of July and August, when the heavy and trying autumn moult is taking place. At this time flight, save for a few yards, is impossible, for a large proportion of the wing quills are then shed, and the tail feathers have dropped completely; so that the brown-barred coloration of the head and neck possibly form a protective mask. But apart from the "usefulness" of this peculiar colour change of the head and neck, there can be no doubt about the relations it bears to the more complete "eclipse" plumage of the mallard.

Thus the resplendent plumage, in the case of both species, answers to the "nuptial" dress of, say the knot, the ruff, or the dunlin. But in the three last-named species, it is to be remarked, the nuptial dress is assumed by a spring and not an autumn moult, as in the case of the Grouse family, wherein it would seem the resplendent dress developed what we may call a precocious tendency, changing the time of its appearance from late to early spring, and from early spring to late winter, and thence back to late autumn. A link in the chain of evidence seems to be furnished by the male red-grouse. This species, like the mallard, breeds in the dress assumed at the autumn moult. In June, after the trying period of courtship is over, he puts on a conspicuously different livery, answering to the "eclipse" dress of the mallard, which is discarded at the autumn moult for the dress which is to serve as the breeding dress. That this plumage, assumed in June—the plumage which Mr. Ogilvie-Grant has called the "autumn" plumage—answers to the so-called "eclipse" plumage of the ducks is, I believe, unquestionable, though it differs less markedly from the dress which is to be the breeding dress—

the "winter-summer" plumage of Mr. Ogilvie-Grant—than in the case of the two plumages of the mallard.

Objections may be raised to this interpretation, but nevertheless, when the facts are squarely faced, it will be found that such objections are groundless. The facts alluded to are as follows:—In a large number of species both adults and young wear a similar and dull-coloured dress throughout the year. In a considerable, but smaller, number of species both sexes, and the young, are similarly but brightly hued. Between these extremes are many gradations, permutations, and combinations. But we may put it, in a general way, that the first to develop resplendent plumage is the adult male, and then as a "breeding" or "nuptial" dress, to be speedily replaced by one of more sober coloration, *e.g.* ruff (*Machetes* (*Pavoncella*) *pugnax*). The female and young in such cases retain the ancestral livery. Later the adult female assumes the dress of the male, leaving the ancestral dress to the young. The blackcock and the partridge[1] indicate the manner in which the earlier ancestral livery is gradually eliminated, and the "nuptial" dress from a seasonal, becomes a permanent livery.

This condensed epitome of plumage evolution may help, it is hoped, to bring the puzzling anomalies of the red-grouse liveries into line with what obtains in the matter of plumage sequences elsewhere. Regarded in this light, then, the plumage of the male red-grouse, which is assumed at the end of the autumn, answers to that of the mallard assumed at the beginning thereof, and in both cases it is worn after the breeding season. The mallard, at this time, goes into "eclipse," that is to say, he exchanges his bright livery for one of more sober hues, and closely resembling that of the female. The red-grouse at the same season assumes what is generally called an "autumn" dress, adopting the nomenclature of Mr. Ogilvie-Grant. It

[1] That the interpretation of "eclipse" plumages here given is well founded is shown by the fact that in the partridge, wherein both sexes are coloured alike, the male and female undergo a similar phase of "eclipse"; this is what we should expect if the premises of this argument have any solid foundation.

Blackcock (two challenging) and greyhen
By A. W. Seaby

answers to the "eclipse" dress of the mallard. But for the fact that this dress does not afford such a striking contrast with that of the "eclipse" dress, this homology would leap to the eyes. This "eclipse" dress answers in both cases to the "winter" plumage of birds such as the ruff, knot, and dunlin. The brightly hued livery worn during the rest of the year by the mallard and grouse answers, as we have already remarked, to the "breeding" dress of these Limicoline birds: but this fact has been lost sight of owing to the process of accelerated development which it has undergone. In the black-grouse, capercaillie, and in the common partridge this gradual decline of the "eclipse" or "winter" plumage has proceeded yet further, so that the head and neck alone, for a short period, assume an "eclipse" or "winter" plumage. In the pheasant these last relics have completely disappeared, and herein we have the last link in the chain of evolution from a permanent dull to an evanescent resplendent type of dress, and thence to a permanent resplendent livery. In some species, *e.g.* parrots, both sexes have participated in this glorification, in others the males only, but the significance of this difference cannot be discussed here.

It would most certainly make for clearness if some term could be agreed upon whereby we could distinguish between typical "nuptial" plumages like that of the ruff and knot, plumages assumed only during the season of courtship, and those which answer to nuptial plumages which have become, or are in the way to become, permanent. The latter might well be called supernuptial plumages. The mallard, red-grouse, blackcock, and pheasant are types of the latter kind.

So far nothing has been said in this connection of the plumages of the female red-grouse. This must now be considered. Mr. Ogilvie-Grant was the first to point out the curious fact that the moulting periods of the two sexes are not synchronous. For what answers to the supernuptial plumage of the male (the "winter" dress or "autumn-winter" dress of Mr. Ogilvie-Grant) is worn by the female from August to March, instead of November to June. In other words,

the female retains what answers to the supernuptial dress of the male a whole month longer—eight months as against seven; while similarly she wears her "eclipse" plumage—the "summer" breeding plumage of Mr. Ogilvie-Grant—a month less, April to July, or four months as against five in the cock.

These discrepancies depend, possibly, not so much on inherent distinctions as on changes in the metabolism brought about by internal parasites! That is to say, the incidence of disease falls differently on the sexes: since during April and May large numbers of cocks appear to fall victims to a parasitic worm, resulting in the disease known as strongylosis. According to the statistics of the recent Grouse Commission, about eight cocks to one hen succumb at this season, possibly because exhausted by the intensity of the courtship, while the female becomes more susceptible to disease after the labours of egg-production and incubation; but then her "eclipse" or moult is accomplished. This explanation, however, is lacking in cogency: another is needed.

On this subject of the moulting and seasonal changes of coloration in the red-grouse a few remarks yet remain to be made. As to the order of the moult, Mr. Grant has pointed out that the first feathers of what he terms the "winter," and what I have termed the "supernuptial," moult begin to appear on the rump towards the end of August or beginning of September, and from thence onwards the renewal of the feathers spreads towards the head, which is the last to change. The "eclipse" dress is assumed in the opposite order —the head and neck being the first to change. But the feathers of the breast and abdomen, be it noted, are not moulted till the autumn, when the "winter" or supernuptial dress is assumed. This fact is one of considerable significance, marking, it would seem, the beginning of the end of the "eclipse" dress—the last phases of which are seen in the capercaillie, blackcock, and partridge, wherein, as we have already remarked, only the head and neck retain remnants of this ancient dress. In June the feathers clothing the "legs" and toes

are moulted, and in July, when the new white leg feathers are appearing, the claws are shed. This shedding of the claws, which occurs also in the red-grouse, is a curious phenomenon difficult to account for.

Finally, it has been asserted that the "eclipse" dress of the female red-grouse is assumed in part by a moult, and in part by a repigmentation and a rearrangement of the pattern in the old feathers of the "supernuptial" dress. There is absolutely not a scrap of evidence, worthy of the name, in support of such a contention: all that we know of the structure and development of the feather, and of the physiological changes of the body generally, is in direct conflict with such an assumption.

We come now to the plumage-changes of the ptarmigan, which, perforce, have been left till the last, since they are remarkable for the fact that they moult no less than three times during the year. This peculiarity, however, be it noted, is shared with the willow-grouse, a species closely resembling the red-grouse, but differing in the assumption of a white winter dress, and the white remiges and wing coverts, and extensive area of white on the under parts. We may probably, therefore, regard this white winter plumage as a livery superimposed on the two normal plumages. The nuptial, or summer plumage of the ptarmigan, it will be noticed, makes its appearance during March and April, and by the end of May is complete. This dress is worn till the end of July. In August the blue-grey dress already described is assumed, and this is worn till the end of October or well into November in mild seasons, when the white dress of winter is assumed.

That the three distinct liveries of the ptarmigan are all highly protective in their coloration there can be no question: there are few birds, indeed, which demonstrate the theory of protective coloration better than the ptarmigan. On this more will be said presently.

What now remains to be said of the Grouse-tribe concerns the history of their courtship and the care of the young: and the

purpose of these pages will best be served if this be told dispassionately.

To begin with, then, while the capercaillie and the black-grouse are polygamous, the red-grouse and the ptarmigan are monogamous. Hence what we may call the initial stages in the matter of the reproduction of the species find more or less strongly contrasted modes of expression.

The courtship of the capercaillie is sufficiently remarkable, and has attracted the attention of most ornithologists, though these, for the most part, have had to acquire their facts at second hand. Of our countrymen perhaps Mr. J. G. Millais, and of Continental naturalists Prince Fürsterberg, have seen more than most of this phase of the capercaillie's life, and accordingly I give, in a condensed form, their account of what happens at this time. Briefly, at about the beginning of April the cock, just before dawn, repairs to some favourite tree—used year after year—and there performs a most wonderful, if unmusical, serenade. With outstretched neck, drooping wings, and spreading tail he gives voice to a weird, uncouth kind of song, described by Prince Fürsterberg as divisible into three parts—(1) *klick-kléck* (pause) *klick-kléck* (pause) *klick-kléck.* At the commencement these notes sound like two little sticks knocked together at intervals of ten or fifteen seconds, getting quicker and quicker till at last they become bell-like. Then follows part number two, which is likened to drawing the cork out of a bottle. The final phase is like the twittering of a bird or the grinding of a knife—*sch-scht-ssts-pss-sch-scht.* But this description conveys no conception of the intensity of feeling which is always displayed during this time. The "song" gradually becomes so fervent, so full of passion, as to deaden the singer to all consciousness of the outer world, and, as a consequence, some "sportsmen" contrive to find a keen enjoyment in stealing up to the bird and shooting it even as it sings! Mr. Millais' description of the song is less detailed, and conveys a somewhat different impression. He likens it to a "variety of noises, or squalls, like two cats fighting at a

Red-grouse; cock (upper) and hen
By A. W. Seaby

distance." And these musical efforts are occasionally varied by a wild leap into the air and much flapping of wings. This strange performance is known as the "lek" or "spel."

Of the behaviour of the hens in regard to this display, strangely little has apparently been recorded. Mr. Millais remarks that "soon after dawn the hens arrive, and run about in some excitement on the open sward near the foot of the "spel tree," while in Lloyd's *Game-birds and Wild Fowl of Sweden and Norway* (p. 21) the females are said to gather at the "laking places," and by harsh croaks endeavour to attract the attention of the male when in ecstasy. Finally he descends and pairs with each in succession. Evidently in this theme much yet remains to be discovered.

Contrast with the behaviour of the capercaillie that of the black-grouse, also a polygamous species, at this time. As in the case of its larger relative, courting begins early in April—weather permitting—but the rôle of the wandering troubadour is exchanged for a species of tournament. A number of males gather at dawn in some open spot, generally a sloping sward of short green grass or some rushy field near the moor in which they have roosted. In assembling they keep up a more or less continuous, resonant, whining call, designed to attract the females which appear anon. Meanwhile two males will meet and proceed to battle: facing one another with lowered head, drooped wings, and arched tails, spread fan-wise, but with the long curly feathers nearly touching the ground. They "set" some thirty yards apart, and advance to within a few feet of one another, then skirmish. Or one will seize the other by the neck and administer a sound beating with his wings. The vanquished then retreats, and the victor mounts some hillock and crows a defiant challenge, changing his tactics, however, to suit the altered conditions. He rises to meet his foe and watches him, with lowered head, allowing the attacker to waste his energies in trying to get above or below his guard. Then suddenly he pounces down on his antagonist, sometimes to engage in a conflict which may last for an hour.

At the approach of the first female hostilities cease, and the males begin a sort of dance, leaping and fluttering into the air several feet. Each "dances" furiously, uttering the while a hoarse cry, each trying, it would seem, to drown the voice of his neighbours. In the intervals of such battles a curious call is commonly emitted, which is likened to that of a cat on the housetops, but hoarser.

Sooner or later, however, the successful males get together a harem, and depart each to his own ground. But until this takes place, the "lek" of the morning is repeated again in the evening, but with less spirit.

A curious fact, to which attention was first called by Naumann, and among British ornithologists, I believe, by my friend Mr. Abel Chapman [1] — Naumann's observations having escaped notice in this country — is that in October blackcock display a sort of revival of the amatory instincts. "On wet foggy mornings in particular," he remarks, "one hears the old blackcocks crooning, bubbling, and sneezing as excitedly as on a fine morning in spring. With a glass I have watched one surrounded by his harem, strutting round some bare little 'knowe,' in fullest display, with neck swollen, tail expanded erect, and wings trailing—truly a remarkable spectacle in October. Whether it is a chronological miscalculation, or arises from a specific cause, the origin of which is lost in the mists of a remote past, the instinct is certainly conspicuous, and for want of a better name I will coin the word 'pseudo-erotism' to designate it. The character is not confined to black-game, for grouse conspicuously, and golden plover to a certain degree, display pseudo-erotic instincts." To these Mr. Millais adds the capercaillie. But these unseasonable displays lack the fire of the spring contests, when rivals occasionally fight to the death, at any rate in the case of capercaillie.

Neither with the red-grouse nor with the ptarmigan do we meet with the same intensity of emotion displayed by the capercaillie and

[1] *Bird-life of the Borders*, p. 208.

blackcock when courting. This is explained by the fact that grouse and ptarmigan are monogamous. The former, after the break-up of the large packs in early spring, resort to coveys again, and it is between the males of these coveys that rivalry is displayed. There is no regular meeting-place, as with blackcock, to which males resort. They meet rather by accident, or in answer to challenges. They fight after the fashion of blackcock, but do not lift the tail so high. Each attempts to deal the other a blow on the head with his beak, springing up in the air and striking downwards. Should one seize the other on the ground, it belabours its victim with both wings and feet. The victor finally flies up into the air and utters a loud "*kok-er-a-kok-kok-kok-go-bach-gobak-goback*" by way of a pæan of victory and a challenge. Sometimes, flushed with victory, he will go further, and chase his enemy for a considerable distance. Occasionally, but rarely, three or four cocks have been all in a mêlée together. Whilst the fighting is going on the female runs round and round uttering a low clucking note by way of encouragement, and finally rewarding the victor by strutting off with him! Each male, says Mr. Millais in his monograph, "that has succeeded in appropriating a female separates her to a distance of forty to a hundred yards from . . . the ground chosen as a mating-place. Here he stands upright, frequently calling '*uk-uk-uk*' or '*bec-bec-bec*,' lowering his wings, erecting his comb, and quivering the tail. . . . The female meanwhile crouches down beside him and remains immovable until another cock grouse accepts the challenge of the male and comes to do battle."

One is not surprised to find that the courting customs of the ptarmigan have been very little studied. The almost inaccessible haunts of this bird render observations of this kind extremely difficult, and only the most enthusiastic among ornithologists care to make the attempt. Practically all that we know of this aspect of the ptarmigan's life we owe to Mr. Millais. In his splendid monograph[1] he gives us the combined results of his study of the ptarmigan when

[1] *The Natural History of British Game-Birds.*

courting, in Iceland and in Scotland. From this we gather that the general trend of events at this time closely resembles what obtains among the Grouse. The males fight after the same fashion, and seek to attract the females by suddenly flying up and alighting, uttering the while loud croaks. These displays begin sometimes before the dawn, and last till about 10 A.M., to be resumed, in a more restrained fashion, as the shadows fall at evening.

As touching the usages which prevail with the birds now under discussion, in the matter of the care of the young, much has been written; though in a great measure the various writers have but recorded the same facts.

This phrase "care of the young" must be allowed to cover the period of the preparation of the nest and the methods adopted for safe-guarding and brooding the eggs. Weather factors play an important part in governing the commencement of the nesting operations. Thus the capercaillie begins to lay in May, but on the higher ground not till June. The blackcock begins in April. Grouse eggs have been recorded in February, but the end of April to the middle of May must be regarded as the normal laying period, and even at this later date blizzards may destroy the eggs, as for instance in 1896, when so late as the third week in that month birds were frozen to death on their nests. Mr. Seton Gordon cites a case[1] where a full clutch had been laid but brooding had not begun when the storm swept over the land, covering the eggs deep in snow. More than a week later they were again exposed and successfully hatched out! Thus the conditions of existence seem to have conferred on the eggs of the Grouse a considerable power of resistance to cold. In other words, we see here selection at work on the unborn young rather than on the parents, since all embryos unable to resist a considerable degree of cold have been eliminated. The ptarmigan, as we would suppose, do not begin to lay till the end of May, and consequently brooding does not commence till June is nigh at hand.

[1] *Birds of Loch and Mountain*, p. 57.

Ptarmigan (summer plumage) hiding from hawk (see Plate XII.)
By G. E. Lodge

While in the choice of a nesting-site our native Grouse—using this term in its wide sense—naturally display a certain amount of difference, due to individual idiosyncrasies or to local conditions, all nest upon the ground. The capercaillie sometimes, however, deposits her eggs in a nest amid the branches of a tree some 10 or 15 feet from the ground. Usually she selects a site at the foot of an old Scotch fir or larch, and occasionally in deep heather.

As with the Grouse generally, she alone incubates, and at the commencement of her sitting will commonly cover her eggs with pine-needles when going off to feed. As soon, however, as incubation has well begun, this precaution seems to be abandoned, which custom suggests that the act of covering the eggs is not primarily for concealment of the eggs. The young, on hatching, seem to break the shell across the equator, and the two halves are then cunningly placed one inside the other by the mother, though it is hard to see what advantage seems to be gained therefrom. Whether the remaining species of Grouse similarly cover the eggs, and in like manner dispose of the empty shells, there are no records to show.

The mortality among chicks seems to be abnormally high, though they have the best of mothers. Even when the whole clutch of eggs is hatched it is rare to see more than three or four youngsters with her after the end of the first week. The rest have either succumbed to spring showers, or have been lost in the deep heather. The survivors, however, grow rapidly, and gain in strength with their increase in bulk.

It is curious that while the capercaillie has had to be reintroduced into Scotland, the black-grouse has never been even near extermination, though the grey-hen is said to be a bad mother, deserting her eggs on the slightest alarm; and she is also charged with being lamentably careless in her choice of a nesting-site. Mr. Abel Chapman cites one or two instances in proof of this trait. In one case a nest was made in a bank thrown up to form a sheep-washing pool on a burn; in another it was placed in a tuft of rushes adjoining

a still: and she will often, he remarks, lay her eggs in a nest alongside a footpath where men and dogs pass daily. As to the care of the young, little or nothing has been recorded, but they seem to be abnormally slow in coming to maturity, for birds hatched in June are not full-grown till mid-September; even when nearly full-grown they are soon exhausted, so that if flushed two or three times they become so bedraggled as to be unable to fly. By mid-September the young cocks separate from the young grey-hens of the brood, and for a time lead a solitary life.

With the grouse and ptarmigan, on the other hand, though the duties of incubation are performed by the females only, the males render some assistance, at any rate in the care of the young. The female grouse sits close, both on the eggs and young, when danger threatens, as is shown by the fact that instances are on record where a sitting hen has allowed herself to be trodden on rather than rise and reveal her whereabouts. Except she move, indeed, she is invisible, so perfectly does her coloration harmonise with her surroundings; and this is true also of the young, and of ptarmigan, as we shall show presently. Occasionally, however, a nervous bird will leave her eggs at the last moment, flying low, and soon alighting, when she runs a short distance and watches. The male, on the other hand, who has been keeping guard near his mate, flies far, repudiating his responsibilities. As soon as the young are hatched, however, he displays more courage. Mounting guard, he will fiercely attack a dog or sparrow-hawk, and has been known to fly straight at a man's head as if to strike, swerving off only at the last minute. Commonly both parents feign wounded.

The ptarmigan, like the grouse, is monogamous, and both parents display considerable anxiety for the young, yet in spite of this there is a considerable infant mortality. Many eggs and broods of young are destroyed by late snowstorms, and besides vicissitudes of climate, they have to contend with many foes. The golden eagle preys largely upon them, though he is an enemy from whom escape is possible, either by flight or by trusting to their protectively coloured plumage, which in

this species has attained a marvellous degree of perfection; for it is only by movement that their presence is betrayed, so closely does their coloration agree with the ground against which in times of terror they cower. A heavy toll is levied on their eggs by the common gull, which of late years has increased in numbers, while crows and ravens tax them still further. To avoid persecution from these enemies, some ptarmigan, at any rate, take the precaution to cover their eggs more or less completely when leaving the nest to feed; and Mr. Seton Gordon cites a case of a pair which had sought concealment for their eggs beneath the cover of a large stone. Possibly this represents the initial stage of a new nesting-habit, due to repeated robberies, for the eggs are less perfectly harmonised with their surroundings, and are readily detected by egg-stealing birds. How perfect is the resemblance between the sitting-bird and its surroundings has been demonstrated by the late E. T. Booth, who made a special pilgrimage to the ptarmigan's haunts on the hills of Loch Rannoch. After searching in vain for eggs, one of his dogs sat down, by accident, on a brooding bird, and so led to the discovery of the first nest, albeit he and two or three keepers had been sitting for more than an hour within a few feet of this particular hen![1] The second nest was found between the legs of the pony which had brought up the lunch. With amazing persistency this bird had remained on its eggs for several hours with the pony towering above her; and only disclosed her presence by flying off in a great flurry when a pannier strap fell on her back during the repacking of the luncheon-baskets at the end of the day! These two nests, and a third disclosed by the attempt of a terrier to seize a sitting hen, were the only nests discovered after a long and careful search by Mr. Booth and his helpers! The male keeps a jealous guard over the sitting hen, never straying far from her vicinity. If alarmed he circles round his mate, and finally alights on the top of some high rock, and there remains protesting. The hen commonly sits close, and will often allow the eggs to be taken from

[1] E. T. Booth, *Catalogue of the Cases of Birds in the Dyke Road Museum, Brighton*, p. 59.

under her rather than move. At other times she will share in the alarm of her mate, and half runs, half flutters over the ground. At such times the male will run in front of her as if to check her flight, bowing his head solemnly up and down; meanwhile both birds keep up a mournful croak. When the young appear, the solicitude of the parents, if possible, is increased. Mr. Millais remarks that the female if flushed when with her brood, and they do not follow her at once, as is the rule, will fly straight away for about 200 yards, then shoot up into the air for about 20 or 30 feet, at the same time calling loudly "*ach-ack-ack*," or "*ee-ack*," to attract their attention. So far no other observers seem to have witnessed this performance.

The young are exceptionally precocious even for game-birds, being able to fly at a few hours from birth. Even when no bigger than thrushes they will ascend and descend perpendicular slopes of several hundreds of feet with ease, accompanied by their parents, in the endeavour to escape some real or imaginary danger. And here, again, we have evidence of the severity of the incidence of natural selection, which has impressed its mark on both adult and young, on their coloration and their mode of flight, and on their instinctive action. The ptarmigan are, so to speak, the most "alive" of all the game-birds.

Ptarmigan (winter plumage) hiding from hawk
By G. E. Lodge

V

WOODCOCK AND SNIPE SHOOTING

By John H. Wyatt

1. THE WOODCOCK

It is probable that no birds, either British or the denizens of other countries, are harder to shoot than woodcock and snipe. This is not due to their speed alone, although they are fast flyers—the latter, indeed, exceedingly fast considering their size—but to a variety of reasons. It must not be assumed, however, that these birds always present difficult marks, for they do not.

Let us take the woodcock first. The average speed of this bird has been estimated to be not more than 40 miles an hour, and this is less than the average speed of a partridge, which is put down at a little over 50 miles an hour; but both birds can exceed 80 miles an hour when pressed. In the open a woodcock is often easy to shoot, because when there is no need to dodge it keeps on a straight course; consequently a knowing sportsman who is aware of the habit of a woodcock to leave the covert for its feeding ground almost always by the same route can get many an easy shot. It is not of this that a true sportsman will take advantage. Still, the man who knows the coverts knows where to look out for the birds, and at the cry of "Mark cock!" he will be more likely than another to add it to the bag.

Woodcock are often found when pheasant shooting is in progress, and many a man would rather bag a woodcock than half a dozen brace of pheasants. Now a woodcock in covert and disturbed in its quiet retreat is a very different bird from a woodcock in the open proceeding quietly upon its own business. On this occasion it will be in a hurry,

and a woodcock in a hurry, where the trees are thick, possesses a most amazing power of dodging; like lightning it turns and twists in and out amongst the trees, and up and down over or under the branches. Then it is that a quick eye, as well as hand and eye in perfect accord, is required for successful shooting. Sometimes a woodcock is found where the trees are small and so close together that it is impossible to see more than a yard or two through them, then in a flash it will rise over the tree-tops; and a sportsman must be very quick to get in a shot at all, and unless he fires well above the bird, the shot will almost certainly pass below, so extraordinary are its powers of acceleration even when rising. As soon as it tops the trees it will begin to drop again, and be out of sight within a very few seconds of rising. Sometimes the whole manœuvre will be carried out at such close quarters that if the bird were hit it would be practically blown to pieces.

The sportsman who is reckoned a good shot, somewhat above the average, will probably prefer to get his chance at a woodcock inside the covert, but where the trees are not too close together, rather than outside in the open. He will then get a shot difficult enough to test his skill and to give him considerable satisfaction if he brings down his bird neatly, but not so extremely difficult as to require more than a fair share of luck.

In many parts of England woodcock are not sufficiently numerous to be regarded as the principal object of a day's shooting, but they are very welcome additions to the sport when mixed shooting is being enjoyed. In Norfolk, however, large bags of woodcock are frequently made, and they come in considerable numbers to the south-west of England and to many parts of Wales. It is recorded in *Shooting—Field and Covert*, which forms part of the Badminton Library, that at Heron Court, the residence of a former Lord Malmesbury, 1,387 woodcock and 5,375 snipe were killed in thirty-nine seasons, from 1801 to 1840 inclusive (in one year there was no shooting); while Lord Malmesbury himself shot 1,080 woodcock and 4,694 snipe in forty seasons, from 1798 to 1840.

The woodcock generally makes its appearance in England in October,

and remains until the end of the shooting season. In severe weather it is driven farther south and west, which accounts for the large numbers often found in Ireland. Very large bags have been made in that country, and also in the Outer Hebrides. The cock generally appear first on the north-east coast, and large numbers are sometimes shot at Spurn Point when they first arrive from Norway. Migratory birds are very apt to rest here after their trip across the sea before proceeding upon their journey, and to shoot them then is not difficult, for they are both tired and hungry. In fact, it seems rather questionable sportsmanship to disturb them at such a time, but possibly it is a case of then, or not at all. With woodcock probably more than with any other bird it is necessary to take very prompt advantage of any opportunity that presents itself, for they change their quarters very suddenly and for reasons which may not be very apparent. Woods may be well stocked with them one day, but if a shooting-party be arranged a few days later it is possible that hardly a cock may be seen.

Woodcock are capricious, too, in their likes and dislikes. To the human eye two places may seem equally well suited to them ; but while one of these places will always hold a couple of cock or so, the other will be empty, not on one occasion only, which might be simply a matter of chance, but as a general rule.

When beating woods for woodcock it is necessary to beat very closely, paying special attention to evergreens if there are any ; for these birds, being night feeders, prefer to rest through the day, especially if the night was fine and they were in consequence able to obtain a full meal, and will lie very close indeed—so close that they may sometimes be knocked down with sticks before they are able to escape from their refuge in the thick undergrowth, their long wings being for the moment a disadvantage. If the previous night has been dark and stormy, then the cock, not having been able to satisfy their appetites—and they are voracious feeders—will be restless, and consequently more on the alert all through the day, but especially so in the afternoon when the next feeding time is drawing near. It is on such an afternoon as this that the woodcock is most difficult to kill, and the sportsman will be well advised

to get in his first barrel the moment the bird rises and before it can get up its speed, for it will be out of shot in an astonishingly short time, and possibly out of sight too if the wood be thick. So in the event of a miss with the first barrel, which is likely enough, as the woodcock's dodging powers increase as it goes faster, the second is either not fired at all or at such a range that the chances of a neat kill are very remote indeed.

In this way many very long shots are fired at woodcock. The same thing happens, too, during pheasant shooting, for when the cry of "Mark cock!" is heard it is customary for every one who sees the bird to have a try at it irrespective of whether it is really his shot or his neighbour's and whatever the range may be. As a consequence of this many shots are missed, and the woodcock's reputation of being the most difficult bird to hit is enhanced. When cock are plentiful this sort of wild shooting is not indulged in to anything like the same extent, and consequently much better results are obtained, especially when the birds are lying well. I have urged the necessity of quickness when shooting cock, but wildness should be avoided at all costs, especially that sort of wildness which causes men to take very long shots. A 50-yard shot should be the very outside limit, for beyond this distance the bird is more likely to be sent away wounded than to be cleanly killed. An exception to this rule is when a bird is seen to be already wounded; it is then worth while to take some risk for the sake of killing it outright, and a wounded bird will, moreover, take less stopping than a sound one.

When woodcock are fairly plentiful it is a good plan to beat the hedgerows and ditches before going into the coverts. In this way a good many birds may be picked up and some fairly easy shots obtained. But if the hedges are high and thick, and the cock slip over them like lightning, as is very likely, they will prove to be a good test of the shooter's skill. I have known pheasants even prove quite difficult under these circumstances when rising very close.

As woodcock are very loth to leave a favourite covert it is always worth while to beat it a second time, for it is quite likely that those birds which were put up and not shot will have turned back and alighted behind the line of shooters and beaters; also it is not improbable, when

the birds are lying really well, that some few have been passed over in the first beat and will be flushed in the second. There is, however, no use in repeating this performance again, because, although birds may still be there, they will be thoroughly roused and alert, and will give the guns no opportunities, for they will get up at long distances, though possibly they will not fly far.

A woodcock will spring up and go off at a speed which suggests that it will fly for a mile or more, but as soon as it emerges from the wood it is quite likely that it will skirt the edge of it and drop in again behind; but, on the other hand, it will sometimes glide towards the ground as if intending to alight, but will instead carry on, skimming just above the ground for a considerable distance. If this happens behind a bush or hedge it is likely enough that the marker will think he has marked down the bird at the spot where he last saw it, or close by, and much time may be lost in looking for it.

In the same way a shooter may be deceived into thinking that a woodcock has dropped mortally wounded, and naturally does not like to leave it behind. When one is really wounded it is not usually difficult to find, as it will squat down on the ground and make no attempt to conceal itself, whereas a partridge will run, and run really fast.

When a cock is properly marked it is not a bad plan for the shooter to make a detour as quietly as possible and get a beater to drive the bird towards him.

Mention is made elsewhere of the huge bags of snipe and woodcock made in Ireland during the severe weather experienced in January 1881, and seen by Sir Ralph Payne-Gallwey. The whole of the west coast of Ireland swarmed with woodcock at that time, and they were shot in large numbers by the farmers and peasants, and sometimes knocked down with sticks. Many notable bags of woodcock have been made in that country, of which the following, recounted by the same writer (Sir Ralph Payne-Gallwey) in the Badminton Library book, *Shooting—Moor and Marsh,* is the most interesting from a sportsman's point of view. It is related in a couple of letters as follows:—

"At Christmas time, 1802, the Earl of Clermont wagered that he

would kill in one day 50 couple of woodcocks; the bet was determined between two and three o'clock, by which time he had killed one couple more than his number. The bet was 300 guineas and took place in Lord Farnham's woods in Ireland. No particular day was fixed, but Lord Clermont (then Mr. Fortescue) was to give notice on any morning that he pleased that he was about to shoot for the wager. He used two French double guns.

"The above was related to me (Sir Thomas Frankland, Bart.) by Lord Clermont at Brighton in July 1803, and copied verbatim."

The second letter gives some more details, and was written in answer to a request from Sir Ralph for further information, which it gives as here set forth :—

"The late Lord Enniskillen, who, like Lord Clermont, was at the time of the bet staying at the house of the Earl of Farnham, at Cavan, recollected that Lord Clermont began to shoot on that day early in the morning, and came in to breakfast much disheartened, having missed many birds and killed but few, and with his shoulder sore from the kicking of his flint gun. Lord Enniskillen advised the shooter to put some padding into his coat sleeve, by which his shooting was so much improved that the hundred woodcock were killed early in the day, all in one large wood called 'Donaweale Wood.'"

This would have been a wonderful performance if it had been done with modern breech-loading guns, but the fact that it was accomplished with old flint locks makes it really extraordinary.

In the *Sporting Review* for October 1847 Mr. Lloyd, the author of many books on natural history and sport, refers to this wager (apparently), and also states that in a single day at Dromore Wood, on Lord Limerick's property, Mr. Mathew Barrington and his party shot 72 couple of woodcock in 1842. Mr. Lloyd expresses an opinion that a good shot who could obtain access to first-rate coverts might well kill 500 couple of woodcock in a single season. Mr. Lloyd's best season in Ireland was in 1820, and in that year he killed 414 woodcock and 1,310 snipe.

There is no prescribed limit laid down for woodcock shooting as for

the shooting of game birds, therefore it may be said in general to begin with the arrival of the foreign birds and to end with their departure. A few of the home-breeding birds are shot each season before the coming of the foreigners, but their number is not large. The close season for woodcock and snipe is the same as that of other birds on the schedule, which are protected during the nesting season. A game licence is required when shooting snipe and woodcock, for although they are not reckoned as game they are specially mentioned in the regulations.

2. THE SNIPE

Generally speaking the speed of British game birds varies directly with their size—for example, a grouse is faster than a partridge, and a pheasant is faster than either. If this were the rule all through, then the snipe would be one of the slowest, as it is one of the smallest. Such, however, is by no means the case, for a snipe is one of the fastest flyers among British game birds, and, moreover, it gets up its speed with remarkable quickness. A golden-plover going down-wind passes like a flash, but a snipe is faster than a plover.

A friend of mine, Mr. H. Mortimer Batten, F.Z.S., some years ago made some very interesting observations of a snipe's speed, and related them recently in an article on "Speed in Wild Life," in *The Autocar*, this article being designed to show the value of a motor car equipped with a reliable speedometer in computing the speed of animals and birds. He was driving a fast sporting car over some moorland country in the West Riding of Yorkshire when he observed a snipe circling round and round the car. He quickened up from 40 to a little over 60 miles an hour, but the snipe continued its evolutions without apparent effort. In the absence of definite information as to the distance of the snipe from the car, and the time it took to make a complete circuit, an exact calculation of its speed cannot be made; but the bird's estimated speed while it was in process of overtaking the car was 120 miles per hour. Outside the hawk tribe, all the members of which are

wonderful flyers, it is hard to find a faster bird than a snipe, and the hawks have the advantage in size; but though faster, they are easier to shoot than the snipe.

The same friend once witnessed what he calls "the most marvellous piece of stunt flying I ever saw." The actors were two merlins and two snipe; the latter were, of course, flying for their lives and the former for their dinners, and this being the case, their speed was naturally very much in excess of that of the snipe which circled the moving car. The burr and rattle of their wings would, he says, have been audible quite a mile distant. The merlins were swifter than the snipe, and frequently made complete loops in the air without slackening speed; but the snipe frequently escaped by dodging. Herein we have the secret of the snipe's ability to escape not only the claws of the hawk but the shot from the sportsman's gun.

Swallows and swifts can fly fast, but they are comparatively easy marks. A high, rocketing pheasant is difficult to kill, especially when the opportunity occurs while the sportsman is among the trees and can only catch a glimpse of the bird between them; so also is a driven grouse or partridge. But rocketing pheasants are often shot on the edge of the covert, and sportsmen of experience can bring down all these birds, one after the other, with almost monotonous regularity and certainty when once they have acquired the knack. On the other hand, snipe shooting in England will never become mechanical, except, perhaps, when a few early arrivals are put up on a hot September day, for in hot weather a snipe seems inclined to be lazy, and does not fly with its accustomed speed and vigour. Snipe are plentiful in India, but, probably on account of the heat, they do not fly like British snipe, and I have known men, who have returned from India with reputations of being excellent snipe shots, quite unable to give a good account of themselves on the Cornish moors—or downs, as they are generally called—or on Dartmoor. In the last-named place the snipe have the reputation of being extraordinarily fast.

It is not within my province to discuss the formation of the snipe in general, but perhaps I may be allowed a word or two concerning its

wings, since these have a considerable bearing upon its flight, and, consequently, upon the difficulty of shooting it. The snipe's wings are built for speed, but not quite in the same way as the swallow's or swift's, which birds are wonderfully stream-lined. When a snipe is flying, its wings, which are long and powerful, are bent backwards at the principal joint, and in use they give the impression of a propeller. This formation gives the bird a power of banking not possessed by many, and to a man watching it just after it is flushed, first the back and then the breast are visible in quick succession as it dodges from side to side. This style of flight may continue for 2 or 3 yards, or possibly for 20 yards or more, when the bird will rise suddenly, and many a snipe is missed because the gun was fired at this moment, and not pointed high enough. It is therefore a good rule to fire high—a good rule with all birds rising before the gun, because most of them rise quickly, and a high shot is far less likely to send a bird away wounded. It is likely to be kill or miss, whereas a low shot may mean a broken leg followed by a lingering death some days later.

In the case of a wild duck or partridge this rule is easy to remember, because either of these birds will rise from the start and keep on for the time at a more or less constant angle; but a snipe will often keep near the ground for a few seconds, and then suddenly make a quick upward turn for a reason which is not apparent to the sportsman, for it may well happen on an open moor, where there is no hedge to top, and therefore it takes him by surprise; and even when he knows that it is likely to occur he does not know exactly when to expect it.

The cry of the snipe—"schaipe! schaipe!"—as it rises, is a boon and a blessing to the sportsman, for the bird often rises behind him, and were it not for this cry it might often get away unperceived. But, on the other hand, it is a little disturbing to the excitable man, and, combined with a snipe's erratic flight, produces sometimes a state of flurry which helps the bird to escape. Some people advise a sportsman to fire the moment a snipe rises, before it can commence twisting and turning. This advice may be good at times—for example, when the birds are wild and are rising at long distances—but it is not easy to follow, as the snipe

begins to dodge at once, a rush of a yard or so in one direction being followed by a similar rush in the opposite direction. At times the turns follow one another with lightning rapidity, and only a short distance is covered between; this rather suggests the hopping of a flea, but on a larger scale. If, therefore, a snipe rises very close it is better not to be in too much of a hurry, but to pause and get some idea of the bird's definite direction before firing.

When migrating, snipe fly in a wisp of a dozen to fifteen or so, but they do not rise in this manner near a sportsman as a covey of partridges will do; therefore, for this reason as well as the greater difficulty of hitting a snipe, a right and left is not nearly so common as with partridges. Snipe will rise in twos and threes within shot, and very often, when one has been fired at, two or three more will rise immediately. It is for this reason advisable to reload with as little delay as may be, keeping keenly on the alert all the time. In fact, the snipe shooter must always be on the *qui vive*, or he will miss many a good opportunity. When snipe rise several at a time they generally do so out of reach of the gun, which is annoying.

I once, and only once, saw two snipe killed with a single shot. This was not an accident, but was done deliberately by one of the best snipe shots I ever met. He was an Irishman named Captain Bird, who had done much snipe and woodcock shooting in his own country, but the incident happened in Cornwall. His method was not that usually practised by first-class snipe shots—or, indeed, of shooters with the gun at any bird—for he used to close one eye and take an aim along the gun; but for all that he was remarkably quick and accurate. On this occasion two snipe got up at the same moment, one on each side of him. Seeing that they were converging and would cross about 40 yards in front of him, he waited until they were just about to do so, and, firing between them, killed the two. This was an excellent example of timing and good judgment.

There is much difference of opinion as to the best way to walk up snipe. Some maintain that it is best always to walk down-wind, because a snipe, like most other birds, will fly against the wind, and will possibly

fly past the sportsman. Now I have often found that snipe are inclined to be very wild when walked up down-wind, and although they will begin their flight against the wind, they will quickly turn round and swing down-wind at a great pace, and it is by no means easy to stop them. Others recommend that they should be approached against the wind. It is likely that the guns will get nearer to the birds in this way, but they will go zigzagging away at a great pace and in their very best shot-dodging manner.

Whether one approaches the birds up-wind or down-wind there will be only one direction of attack, and the nature of the ground may often render this impracticable. It is often necessary to ignore the wind and do the best one can. Personally, I prefer, when possible, to have the wind on my side. This has the advantage of giving two possible directions instead of one, as the wind may be either from the left or the right. The former is perhaps preferable, because most sportsmen find it easier to swing the gun to the left than to the right, but it should make no real difference. In either case, if the snipe starts off against the wind he will be flying across the gun instead of directly away from it, and his sudden turns will make less difference.

There is but one way of shooting snipe, and that is to estimate correctly the position of the bird at a given moment—namely, the moment when the shot from the gun will cross the bird's line of flight—and to throw the shot upon that spot. This means, as I have said before, firing well forward and high. It is impossible to give the distance that one should aim in front of the bird in feet, as so much depends upon the angle of the bird's flight, its distance from the gun, and whether the sportsman is swinging his gun or firing with it stationary. Two feet may be enough, or 6 feet too little: one must learn by experience and observation. Of course a lucky fluke may occur when snipe shooting as at any other sport, but these will be rare.

Though there is but one way of shooting a snipe there are many ways of missing it. The commonest are due to firing too late, too low, or too far behind; but time and again the bird's flying ability will beat a man who is endeavouring to do the right thing.

One or two instances from my own experience may be helpful. Once a snipe rose in front of me on an open moor and flew straight away. I fired just above it, but even as I pulled the trigger I knew that I had missed, for the snipe, which was flying about 6 feet above the ground, suddenly dropped to the level of the reeds and the shot passed harmlessly over it, after which it kept low for a yard or so and then resumed its normal flight. On another occasion I was walking through some small reedy fields in a Cornish valley when a snipe sprang up and made off towards the right, flying low as if it meant to pass through a gap at the corner of the field. I swung my gun well in front, for it was flying fast, but as I fired it turned suddenly to the left, at the same time rising as if to clear the high hedge, so that when the shot passed it was 2 yards at least from where I expected it to be. However, I made it evens with my left barrel, but I had to move the gun through 90 degrees or more before firing again.

Every snipe shot experiences this kind of thing at times, and it adds to the fascination of the sport, which never becomes dull while snipe are to be found. There is another reason why snipe escape unexpectedly at times, especially from long shots when fairly large shot is being used, which is that the snipe's body, being small, sometimes escapes between the pellets, though they pass on all sides of it. This, of course, is pure bad luck, and not bad shooting.

It often happens that the ground on which the sportsman is standing makes a shot at snipe much more difficult than it would otherwise be, for if a man is picking his way across a bog he may well be taken at a disadvantage. Supposing he turns quickly for a shot, and in doing so steps into a hole, his chances of a successful kill are very small indeed. It comes natural to put forward the left foot when firing, and if that foot meets the ground sooner or later than was expected it will certainly disturb the aim. Or, again, the sportsman may be among tall reeds, taller perhaps than himself, and these naturally add to his difficulties.

So far, in writing these notes, I have had the common- or full-snipe in mind. The great-snipe is not so active, and is consequently easier to

shoot if it lies well. The jack-snipe generally lies well—sometimes so well that it is passed over—but it is an inveterate dodger, and so it very often escapes, to give the sportsman a second chance, for it usually does not fly very far. It seems to be able to pick up a living more easily than the full snipe in frosty weather, and at this time will be found in good condition, when its larger cousin is very thin.

In a hard frost the snipe will leave the open moors and seek their food in ditches and any place where the ground is soft and wet—by the sides of ponds where the reeds check the frost and on the margins of brooks. At such times it is worth while to walk a root field for snipe, especially if it be bordered by a wet ditch. Excellent snipe shooting is to be had in Norfolk, but a hard frost will drive the birds in a westerly direction—to Cornwall and Ireland, where the frost seldom interferes seriously with them.

3. SHOOTING METHODS

Two methods of shooting are employed by sportsmen—one is to align the gun and the bird by closing one eye and looking along the barrel; the other is to keep both eyes open and look at the game only, knowing by "feel" where the gun is pointing.

The former takes time, and I cannot recommend it either for woodcock or for snipe shooting, although I have already mentioned a friend who used this method with great success. He was, of course, exceptional. The latter, the far more usual and more generally approved method, was that of the best snipe shot I ever met, Mr. C. O. Clark, a Devonshire man, and his quickness was remarkable—so much so that he would kill snipe with certainty when they rose so far away that many a man would not have fired at all. This latter method is known as snap-shooting, and it can be carried out in two ways; but whichever way is eventually adopted, it presupposes the ability to point a gun with accuracy without looking along the barrel, just as when playing cricket a batsman does not look at his bat but knows its position exactly and keeps his eye on the ball. Similarly, a man using

an axe or a hammer looks not at his tool, but at the object he wishes to hit. Some little practice may be necessary before this facility of knowing the direction a gun is pointed by the feel, as it were, is gained, but it must be done before success will be at all regularly attained in the field.

Having accustomed one's self to watching the bird with both eyes and depending upon the hands and arms for direction, either of two methods may be adopted. The gun may be raised quickly to the desired position and fired while fairly stationary, or it may be swung with the movement of the bird. In any case, it is essential to fire well in front and high; but the allowance need not be so great when the gun is swung as when it is stationary. Personally I prefer to swing the gun when possible; but this is not always so by any means when shooting woodcock in cover and snipe getting up wild. It is often a case of up and shoot in a moment if one is to fire at all.

It is necessary to remember that allowance must be made for the time it takes to pull the trigger, as well as for the time occupied by the explosion and the shot reaching the object; and while this last is happening a snipe may well fly 6 yards, or more if the range is long. I am assuming that it has already attained a high speed. It will not often be necessary to allow 6 yards of daylight between the bird and the spot where the gun is pointing, because the bird will seldom be flying straight across but generally be going away as well.

A light gun is desirable for both woodcock and snipe shooting, and cartridges loaded with a moderate charge. For snipe shooting No. 8 shot is a good all-round size; it will kill well up to 50 yards or so. But if the birds are lying well No. 9, or even No. 10, will give very good results, and the bird will be less likely to escape through a gap in the pattern with the shot all round it, which may happen with larger shot, for the snipe's body is but small.

When woodcock are being shot with other game it is necessary to compromise to some extent, for it is better to shoot at a woodcock with shot that is too large than to wound a pheasant with shot that is unlikely to kill it. No. 7 is good when woodcock and other game are

fairly divided. If pheasants predominate, I should use No. 6 shot, and for cock alone No. 8; but the question of the best size of shot for all kinds of game is a vexed one, for some favour a small size even for so large a bird as a pheasant. In these days it is hardly necessary to say that smokeless powder is best, for the smoke from black powder will often make a second barrel impossible. Some writers advise No. 5 for woodcock; but this is, I think, too large, though I knew a man who once shot a snipe—a jack it was, too—with BB shot. He had loaded with this size under the impression that he might see a seagull! In *The Field* of August 30, 1923, it is related that a jack-snipe was shot with No. 2. It fell in an open spot, and although feathers marked the place and a good dog was available it could not be found.

VI

NATURAL HISTORY OF THE WOODCOCK AND SNIPE

PRELIMINARY CLASSIFIED NOTES

[F. C. R. JOURDAIN. W. P. PYCRAFT. A. L. THOMSON]

WOODCOCK [*Scólopax rustícola* Linnæus. Muffcock; muckle-snippack (Shetlands). French, *bécasse*; German, *Waldschnepfe*; Italian, *beccaccia*].

1. Description.—Apart from its large size, the woodcock may easily be distinguished by the broad transverse black bands which cross the back of the head and nape, and the closely barred under parts. The sexes are alike, and there is no seasonal change of coloration. Length 14·25 in. [361·94 mm.]. (Pl. XIV.) The forehead and crown are of a brownish grey, sometimes finely barred with darker grey, and generally marked with an incipient median stripe running backwards from the culmen. The hind crown, occiput, and nape are crossed by four bars of dark chocolate-brown, almost black, divided from one another by narrow bands of buff. The lores are marked by a narrow band of dark chocolate-brown, and there is a similar band below the eye running back to join the lowermost nuchal band. The back of the neck is of a brownish grey blotched with black, while the sides and front of the neck are greyish buff, marked by fine subcrescentic dusky bars. The throat is white, bounded below by a more or less distinct subcrescentic band of dull black and chestnut. The back and wings are of varying shades of chestnut, barred and blotched with black. The interscapular region is bounded on either side by a more or less conspicuous longitudinal band of silver-grey, while the central area of the region is marked by two broad irregular bands of black, and barred obscurely with dull black. The scapulars are chestnut-red, and marked by narrow bars of black and irregularly disposed blotches of black and silver-grey, forming in some individuals a more or less distinct longitudinal band, in others isolated patches. The marginal wing-coverts are of a chestnut or sometimes brownish red, and marked

by two or more narrow bands of black. The minor coverts chestnut-red, crossed by narrow double bars of black enclosing a pale central area. The two lowermost rows of minor coverts, the median and major coverts, are commonly tipped with buff, forming four more or less distinct transverse bars. The major coverts and secondaries are crossed by broad bars of black, and in some individuals these bars are solid and conspicuous, in others the edges of the bars alone are black, the centres being dark grey. Thus some individuals appear conspicuously barred, others not. The primaries are dark grey, the outer webs notched by triangular patches of chestnut, while the tips are white, and this pattern is no index of sex or age. The rump and tail-coverts are chestnut, barred black. The tail feathers are black, tipped above with silver-grey, below with white, and notched along the exposed portions of the webs with chestnut. The breast and abdomen are dull white or pale buff, barred with narrow dusky lines, and the under tail-coverts are buff with black shaft-streaks and irregular loops of black. In the males the shaft-streaks are more sharply defined than in the female, and the feathers are more or less conspicuously tipped with white. The fledgling cannot be distinguished from the adult when once the remiges have completed their growth. The young in down are buff coloured, with a reddish chocolate median band extending along the back to the crown, where it branches to run forwards over the eye to the lores, enclosing a narrow median stripe. Often there is a buff spot on the nape, which may enlarge to form a transverse bar cutting through the median band just described. On either side of the dorsal band is a narrow lateral stripe. [W. P. P.]

2. Distribution.—In the British Isles this species is widely distributed, but somewhat local in the breeding season. It is naturally most numerous in well-wooded districts, but is absent for no apparent reason from some localities which appear to be well suited to it. In the Lake district it is numerous, and also in some of the well-wooded parts of middle and north Scotland and in Ireland; but there are few counties where it has not been occasionally known to breed. Even on the Orkneys and Shetlands, which can hardly boast of trees at all, it has been known to nest occasionally, as well as on many of the Inner and Outer Hebrides. Outside the British Isles it breeds on the Continent up to nearly 70° in Norway, 65° in Finland, and 66° on the Petchora, and from these limits it is found southward in diminishing numbers to the Caucasus and Crimea, the Balkans, Tyrol, North Italy and the southern spurs of the Alps, and Central France. Its main European breeding-haunts are the forests of Scandinavia and Russia. It breeds on the Atlantic isles

(Azores, Madeira, and the Canaries), and in Asia ranges from about 62° in West and 64° in East Siberia, at least as far as the Lena, while southward it is known to breed in Kashmir and the Himalayas at upwards of ten thousand feet. It also breeds in Japan. In winter its southern range extends to the Mediterranean region and North-west Africa as well as Egypt, and in Asia to S. Persia, India, Ceylon (rare), Burma, and China. As a straggler it has occurred in the Færoes, Spitsbergen, and in eastern North America. [F. C. R. J.]

3. Migration.—A large number of woodcock breed in the British Isles, some of them being resident and others summer visitors: a far greater number visit our area in winter or on passage, breeding in Northern Europe. Taking first the movements of the British-breeding woodcock, we find that a certain amount of definite information exists in the form of records of marked birds recovered. The following is a summary of the records of young woodcock marked on the Duke of Northumberland's estate at Alnwick (Northumberland) between 1891 and 1908 (for the unclassified list from which we have made this summary, cf. Lord William Percy, *Country Life*, Feb. 27, 1909):—

Birds recovered in their first winter:—

September, Home; and Heriot, Midlothian (Scotland);
October, Home (2);
November, Home (10); Forfarshire (Scotland); and Somerset;
December, Home (5); Co. Wexford (Ireland); and Argyll (Scotland);
January, Home (7);
March, Co. Cork (Ireland).

Birds recovered in their second winter:—

October, Home;
November, Co. Limerick (Ireland);
December, Home (4); and Co. Antrim (Ireland);
January, Home (2).

Birds recovered in their third winter:—

November, Home (3);
December, Home; Côtes-du-Nord, Brittany (France); and Galloway (Scotland);
January, Home (2);
February, Home.

Birds recovered in their fourth winter :—

November, Home ;

December, Home ;

January, Home ; and Co. Cork (Ireland) (2).

Birds recovered in their fifth winter :—

December, Home.

Birds recovered in their sixth winter :—

December, Home.

To this we may add a summary of a few records of young woodcock marked at Baron's Court, Co. Tyrone, Ireland (cf. Hamilton, *Field*, 17th Oct. 1908, p. 717, and 24th Oct. 1908, p. 745) :—

Birds recovered in their first winter :—

Home (2) ; and Inverness (Scotland).

Birds recovered in their second winter :—

Home (6) ; Harrow, Middlesex ; and Cornwall.

And of woodcock marked near Carlisle in May 1911 (cf. *British Birds*, vol. v. p. 186) :—

Birds recovered in their first winter :—

October (31*st*), Co. Galway (Ireland) ;

November, Cumberland and Dumfriesshire.

Finally, there are records of (1) a young bird marked on Lord Ardilaun's estate at Cong, Co. Galway, Ireland, in the spring of 1910 : this was recovered about forty miles north of Oporto, Portugal, on December 28, 1910 (cf. *British Birds*, vol. iv. p. 280) ; (2) another young bird, marked near Stonehaven, Kincardineshire, Scotland, on 13th June 1911, and reported shot on 4th January 1912 near Gijon, on the north coast of Spain (*Aberdeen University Bird-Migration Inquiry*).

It is necessary to give the above somewhat full summary of the records, because the interpretation of them is uncertain. But the main points seem to be as follows : a great many of the birds are resident and stationary ; others disperse in all directions, including north, during the winter months ; and some of the latter which take southerly directions perform journeys of considerable length, which may doubtless be classed as true migratory movements.

The great autumnal immigration sets in in October, and is at its height in that and the succeeding month. It is continued from Great Britain into

Ireland, the birds crossing from Scotland rather than from Wales, and arriving on the coast of Ulster, and later concentrating, in severe winters, on the southern and western seaboards (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 269). Birds which have probably overshot the mark have been observed returning to Cornwall and the south-west of Ireland from a south-westerly direction (cf. Yarrell, *British Birds*, 4th ed., vol. iii. p. 325). To what extent woodcock pass through to countries farther south is uncertain. The return emigration from the British Isles begins early in March, and it is worthy of note that many of the winter visitors are still in the country after our home-breeding woodcock have started their nesting operations.

The woodcock is, as a rule, a gregarious and a nocturnal traveller, and it is very frequently recorded from the light-stations. [A. L. T.]

4. Nest and Eggs.—The nest is merely a depression in the ground, usually in a wood, though it has been found among heather on a moor. The only lining materials used are dead leaves or a little moss, and Saunders states that the dead leaves are usually added during incubation, presumably by the hen. (Pl. XIII.) The eggs are normally 4 in number, sometimes only 3, and in a few cases 5 have been found in one nest. They are not nearly so pyriform in shape as most eggs of Limicoline birds, but are frequently a broad oval. The ground-colour is light creamy yellowish, some eggs showing a beautiful warm brown tinge, which usually fades rapidly, while others when first laid are greenish yellow. They are rather sparingly marked, as a rule, with blotches and spots of varying intensity of reddish or yellowish brown, and underlying ashy shellmarks. Clutches of pure white eggs have also been recorded, but are rare (*Field*, June 1, 1907; *British Birds*, i. 124). Average size of 71 eggs, 1·74×1·33 in. [44·0×33·8 mm.]. Incubation is chiefly performed by the hen, but according to Forester Schupke she is relieved by the cock for an hour or an hour and a half at midday (Naumann, *Vögel Mitteleuropas*, ix. p. 217). The duration of the period is variously given: Naumann was almost certainly in error in giving it as 17 days; but a nest watched in Norfolk by Dr. Fitch was occupied by a brooding bird for at least 21 days (*Birds of Norfolk*, ii. p. 289); W. Evans estimates the period as 20 days from the laying of the last egg (*Ibis*, 1891, p. 80); and H. S. Gladstone at 23 days (*Birds of Dumfries*, p. 385). In the British Isles it is an early breeder, and the first eggs may be found towards the end of March or early in April. Probably many birds are single-brooded, but as occasionally nests with eggs have been found not only in June, but even late in July, it is evident that a second brood is sometimes reared. In one case (recorded in the *Field*, May 6, 1899)

a nest with 4 eggs was found in Co. Tipperary on July 21, 1892, which was believed to be the second brood of a bird which had young on April 2. [F. C. R. J.]

5. Food.—Worms, slugs, insects, and small crustaceans and molluscs. Vegetable matter has been found in stomachs of individuals examined, but this is apparently taken either accidentally with other food or when the birds are hard pressed (Naumann, *Vögel Mitteleuropas*, ix. 214). For the food and feeding of the young, see p. 152. [W. P. P.]

GREAT-SNIPE [*Gallinágo media* (Latham); *Gallinago major* (Gmelin). Double-snipe, solitary-snipe. French, *grande bécassine*; German, *grosse Sumpfschnepfe*; Italian, *croccolone*].

1. Description.—The great-snipe may readily be distinguished from the common-snipe by the white outer tail feathers, which are more or less barred with black. The sexes are alike, and there is no seasonal change of coloration. (No Plate.) Length 10·5 [255·27 mm.]. The general coloration of the great-snipe is like that of the common-snipe, but it differs in that the flanks are more coarsely barred with black, and the wing-coverts are conspicuously tipped with white. The axillaries are heavily barred with black. Finally there are sixteen tail feathers, while in the common-snipe there are but fourteen. Immature birds are somewhat more rufous than the adults, and the longitudinal yellow stripes less distinct. The young in down differ from those of the common-snipe in being somewhat less rufous in colour, especially on the under parts. [W. P. P.]

2. Distribution.—On the Continent this species is found in the breeding season very locally in Jylland, and sporadically in small numbers in N. Germany (E. Prussia and Holstein), while it is said also to have bred occasionally in various parts of Holland. In Scandinavia it nests in Norway, chiefly in the birch region north to Tromsö, and in Sweden from Skåne to Lycksele in Lapland. The main breeding-grounds of this species are, however, in Russia, where it breeds up to 61½° in Finland, and from 65½° on the White Sea to 67½° on the Petchora. Southward its southern limit is Bessarabia on the south-west, and about 51° on the Volga and in the Urals, but a few are said to nest in the Caucasus. In Siberia it breeds in the Altai, and also east to the Yenesei valley, where Popham met with it up to lat. 71°. On migration it passes through Europe and South-western Asia across the Mediterranean, wintering in Africa, and ranging south to Natal and Cape Colony, but avoiding the western parts of tropical Africa, and apparently

migrating down the east side. It has occurred as a casual wanderer in Hudson's Bay. [F. C. R. J.]

3. Migration.—A bird of passage in small numbers, chiefly to the south and east coastal districts of England. On the autumn passage the birds, generally young, are usually recorded between the middle of August and the middle of October. On the return journey it is less frequently met with. [A. L. T.]

4. Nest and Eggs.—Does not breed in the British Isles, but see p. 168. [F. C. R. J.]

5. Food.—Chiefly worms, insects, and small snails. [W. P. P.]

COMMON-SNIPE

[*Gallinágo gallinágo* (Linnæus); *Gallinago cœléstis* (Frenzel). Full-snipe, single-snipe, heather-bleater, air-goat; snippack, gowk, horsegowk (Shetlands). French, *chèvre volante*; German, *gemeine Sumpfschnepfe*; Italian, *beccacino reale*].

1. Description.—The common-snipe is to be distinguished from the great-snipe by the tawny-rufous colour of the outer tail feathers, which are fourteen in number. The sexes are alike, and there is no seasonal change of coloration. (Pl. XV.) Length 10 in. [254·00 mm.]. The crown is marked by a median and two lateral lines of buff; lores dark brown. The back and sides of the fore-neck are buff, more or less distinctly striated with dark brown, but the striations on the fore-neck are blurred and may be wanting. The interscapulars and scapulars are black, with narrow ochreous free edges forming semicircular lines of yellow. Usually these lines are very imperfect and give rise to small ochreous spots. The feathers along the outer border of the interscapulars have the outer webs of a rich buff, forming a conspicuous longitudinal band: the hindmost feathers have the exposed portions of the web black crossed by two narrow ochreous bars, and tipped buff. Scapulars black, crossed by narrow ochreous bars to form large black blotches. The outermost feathers have the greater part of the outer web rich buff, forming on each side of the body a longitudinal buff stripe running parallel with those of the interscapulars. Wing-coverts dark brownish grey, tipped white and buff. The long inner secondaries have the inner web dark grey, the outer barred alternately with buff and black, and with an indistinct outer edge of white. Major coverts and secondaries dark grey, narrowly tipped white; primaries dark grey. The tail feathers have the basal portion velvet black, succeeded by a band of yellow, of varying width in different individuals. The yellow band is bounded by a subterminal bar of black

and a terminal band of white. The relative widths of the black and yellow bands vary considerably. The breast and abdomen are white; the flanks white or buffish white, and more or less distinctly barred with dark grey. The axillaries are white, barred black. The under tail-coverts are pale brown, more or less distinctly barred with dull black. The iris is brown, the beak brown, darker at the tip, and the legs and toes are greenish olive. The juvenile (fledgling) differs from the adult in lacking the longitudinal stripes along the back, which is black relieved by elliptical lines of dull buffish white and dark chestnut. The long inner secondaries are barred alternately with black and dark chestnut. The forehead is pale brown, obscurely barred with black, and the flanks are similarly coloured. The young in down is of a rich dark chestnut, with two more or less distinct longitudinal stripes in black and silver. Above and below the eye is a line of white and black. The forehead is transversely barred with black as in the adult woodcock, the nape is similarly barred, while the under parts are of a dark chestnut inclining to grey. [W. P. P.]

2. Distribution.—In England and Wales this species is widely distributed. but as its breeding-places are confined to marshes and swampy fields, it is necessarily local. It is, however, more plentiful in Scotland, and breeds in considerable numbers in the Hebrides, Orkneys, and Shetlands. It is also common and generally distributed in Ireland. Outside the British Isles it breeds in the Færoes and Iceland, while on the Continent its range extends from the extreme north of Norway and Russia southward to the Alpine chain and some districts of North Italy, but not to the Iberian Peninsula. Eastward it is recorded as nesting in Montenegro, and sparingly in Austro-Hungary, while in Russia it is said to breed in the Caucasus. In Asia its northern limit is about 66½° in West Siberia and 70° in the eastern side, and its southern range extends to Turkestan and Yarkand. East Siberian birds have been separated by Buturlin, and North America is inhabited by an allied race. The winter range of the common-snipe is extensive: it reaches the Atlantic Isles (Azores, Madeira, and Canaries) and Senegambia on the west coast of Africa. Some winter in the Mediterranean region and the Red Sea district, and from thence through Persia, India, Ceylon, Burma, and the Andamans to China, Formosa, the Philippines, Moluccas, and Japan. It has also occurred casually in Greenland and the Bermudas. [F. C. R. J.]

3. Migration.—A resident and a winter visitor. The immigration takes place chiefly in October and November. During the winter the birds frequently shift ground owing to the weather, but some of them remain in the country till

Photo by J. C. Crowley

Four young snipe in nest

Photo by W. Farren

Snipe walking into its nest

Photo by E. A. Wallis

Woodcock's Nest

March. The immigration extends to Ireland, lasting from September till December, although at its height in October: the birds come mainly from the north-east to the coast of Ulster, and in frost they move towards the west side of the island. The return movement takes place chiefly in March, but does not altogether cease till May (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 278). The snipe is frequently obtained at the light-stations. [A. L. T.]

4. Nest and Eggs.—The nest is a rather neat, cup-shaped hollow in a tussock or clump of rushes, in some marshy place, sometimes among heather or in wet meadows. It is lined with dead grasses alone, and is not easy to find except for the fact that the sitting bird when flushed rises straight from the nest. (Pl. XIII.) Whether the cock assists the hen in building is not recorded. The eggs are normally 4 in number, large for the size of the bird, and placed with their pointed ends together. Nests have occasionally been met with containing the unusual number of 5 eggs. They are pyriform in shape, and the ground-colour varies, as a rule, from pale greenish yellow to olive-brown, sometimes quite deep in shade, but usually light. Some eggs show a distinct pale greenish ground. The rich markings consist of vandyke-brown or blackish-brown spots and blotches, chiefly at the large end, and sometimes tending to a zone, with underlying ashy shell-marks. Average size of 100 eggs, 1·56 × 1·12 in. [39·8 × 28·7 mm.]. Naumann gives the incubation period as 15 to 17 days, which is probably too low, as W. Evans notes that the eggs hatched on the twentieth day from the laying of the last egg, and Hantzsch gives the period as 18 to 20 days. Most of this duty is certainly performed by the hen, the male sometimes squatting close at hand or "bleating" overhead. Hantzsch states that he occasionally takes her place at rare and irregular intervals. The breeding season usually begins about mid-April, though occasionally eggs may be found in the last ten days of March, and fresh eggs may often be found up to the middle of May. In the Shetlands few eggs are laid before the beginning of May. Although many birds only breed once in the season, there is strong evidence that a second brood is occasionally reared, and there are several instances on record of eggs having been found as late as mid-August. [F. C. R. J.]

5. Food.—Worms, insects and their larvæ, slugs, and molluscs. Vegetable matter, chiefly grass, is also found in the stomachs of birds examined (Newstead, *Food of some British Birds*, p. 81). The young, at least for some days, are said to be fed directly by the parents (*British Birds*, mag., ii. 250). No definite information as to the nature of their food is available. [W. P. P.]

JACK-SNIPE [*Gallinago gallínula* (Linnæus). Half-snipe. French, *bécassine sourde*; German, *kleine Sumpfschnepfe*; Italian, *frullino*].

1. Description.—The jack-snipe may readily be distinguished from the common-snipe, apart from its much smaller size, by the absence of the median line of buff in the crown, the metallic purple of the rump, and the vivid metallic green gloss on the interscapulars. The sexes are alike, and there is no seasonal change of coloration. (Pl. XVI.) Length 7·5 in. [179·07 mm.]. The centre of the crown is black, with an irregular, inconspicuous band of dark chestnut down the centre, which is soon lost by abrasion. There is a broad superciliary stripe of dark buff extending forwards to the beak. The lores are black, and there is a dusky malar stripe. The hind-neck is reddish, mottled with black. The back is marked by an inner sub-median stripe of ochreous buff, and an outer, less conspicuous stripe of the same hue, formed by the outermost of the interscapulars and by the outer scapulars. The interscapular stripe is formed by the outer and inner webs respectively of alternate feathers. The dark portions of the interscapulars have an intense metallic green gloss, relieved by one or more elongated spots of dark chestnut. The outer scapulars are of a rich chestnut barred with black, and with the outer webs rich buff, forming the lower end of the outermost longitudinal stripe. The minor coverts are tipped with buff and white. The remiges are dark grey; and the rectrices are dark grey edged with buff, the central feathers long, pointed, and black, broadly margined with ochreous buff: the outermost upper tail-coverts are longitudinally striped with yellow, continuing the line of the submedian dorsal stripes. The fore-neck and fore-breast and flank are dull white, obscurely striated with dark brown, and the under tail-coverts are white. The female is slightly larger and duller than the male. The juvenile plumage differs from the adult in lacking the metallic gloss. The young in down scarcely differ from those of the common-snipe. [W. P. P.]

2. Distribution.—The jack-snipe is only a winter visitor to the British Isles, but on the Continent it breeds on the high fjelds of Scandinavian Lapland, and also in Northern Finland south to lat. 64° according to Buturlin, and on the tundra of North Russia. In Russia it ranges south, according to the same writer, to the governments of Perm, Kazan, Vologda, Jaroslav, Vladimir, Orel, Tula, Tver, and the Baltic provinces, and has bred in N. Poland. It is also stated to have nested in various localities in N. Germany and in the Alps, but in most cases on very inadequate evidence. In Asiatic Russia it ranges across Siberia to the tundras of

the Boganida and Kolyma, but avoids the extreme north. In winter it passes through Europe to winter in the Mediterranean basin and Northern Africa, while in Asia its winter quarters lie in Palestine, Persia, Afghanistan, India, Ceylon, and it rarely reaches Burma, China, and Japan. [F. C. R. J.]

3. Migration.—A winter visitor. The jack-snipe is rarely reported before September, and the chief influx takes place in October, after which the species is widespread till April. It is said to be less frequently obtained at the light-stations than the common-snipe (cf. Saunders, *Ill. Man. Brit. Birds*, 2nd ed., 1899, p. 575). [A. L. T.]

4. Nest and Eggs.—Does not breed in the British Isles, though assertions have been made to this effect from time to time; but see p. 168. [F. C. R. J.]

5. Food.—In the stomachs of four individuals examined, Mr. Newstead (*Food of some British Birds*, p. 82) found fragments of beetles, fragments of shells (*Tellina balthica, Helix*), vegetable matter, some of which was identified as grass. [W. P. P.]

1. WOODCOCK AND SNIPE

[W. P. Pycraft]

The very mention of the words "woodcock" and "snipe"[1] is enough to quicken the pulses of sportsmen, for they stand for strenuous days with gun and dog, and "delicatessen" by glowing hearths, when all without is cold and desolate! But there are other points of view from which snipe and woodcock may be regarded, and unfortunately they have been sadly neglected, so that we know far less of these birds, in so far as how they "live and move and have their being" is concerned, than should be the case when we recall the generations of men who, from their love of sport, and wild places, have lived, almost the year round, in the haunts of their eagerly sought quarry.

No one better than the sportsman knows how difficult woodcock and snipe are to find—that is to say, how closely they resemble their surroundings. Yet it never occurred to him to speculate on the possible meaning of this harmony between the bird and the brakes and briars. Others no less keen on wild life, but surveying it with other eyes, have, however, succeeded in no small measure in establishing a relationship between these. During recent years it has been made more and more certain that the coloration of birds and beasts is fraught with a deep meaning; though this meaning has been confused by mistaken attempts to make one interpretation fit all cases. This is folly. What, anyhow, is the significance of the coloration of the birds now under consideration? Be it noted this coloration, as we have just hinted, is of such a character as to render the wearers almost indistinguishable from the soil and vegetation around them. It is a protective garment, conferring invisibility as

[1] Snipe (with a capital) refers to the genus only, *i.e.* all its species considered collectively. —Edit.

complete as that acquired by the possessor of the magic fern seed: it is what Professor Poulton calls an "aphanistic" or "obliterative" coloration evolved, as some would say, for protective purposes. But the use of the word purpose in this connection is misleading. As well might we say that the smooth edges of a rock have been formed for the purpose of enabling the water—rain, or waves as the case may be—to run off easily! The smooth edges are made *by* the water, not *for* it. Similarly the russet hues of snipe and woodcock have been determined by the forces of the environment: there has been no goal to be attained: the birds have acquired their peculiar likeness to their surroundings, when at rest, as a result of the action of natural selection, which gave over, for a prey to the hawk, the fox, and the polecat, all which, by reason of their inherent tendencies, developed coloured areas tending to make the wearers conspicuous.

The woodcock and our three species of Snipe afford admirable illustrations of "protective obliterative resemblance,"—that is to say, of a coloration which confers protection on an otherwise defenceless bird. The hue and the pattern of this coloration differs in each as their habitat differs, and more especially as their *breeding* habitat differs, thus indicating what we may call the "incidence" of selection. The woodcock, as its name suggests, is generally a dweller in the woods, and seems especially partial to such as contain a fair number of oaks; the Snipe, on the contrary, prefers the more open marshland. Hence we may explain the peculiarities of coloration and pattern already referred to. In the woodcock, it will be remembered, the russet ground-colour of the upper parts is variegated with bars and blotches of black and silver—broad transverse bars of black across the crown, blotches of black along the back. But stripes, too, are present, though these are not by any means a striking feature of the plumage, as in the snipe. These markings occur as a broad line of dark brown running from the beak to the eye, and a longitudinal band of lichen-grey, sometimes rather golden grey, on either side of the back. In some birds, too, there are three or four more or less conspicuous

transverse bands of silver-grey or buff and black running across the closed wings, while the primaries and under parts are conspicuously barred. But not the least distinctive feature of the woodcock is the lichen-grey tip to the upper surface of the tail, while the under surface of the same region varies from silver-grey to white. To properly appraise the significance of this coloration, one must see the bird in its natural surroundings, brooding its eggs, or crouching low in dread of discovery by its arch enemy man, or his boon companion the dog. Only by accident, as a rule, and commonly by the glitter of the great anxious eye, can the form of the crouching bird be picked out from among the fallen leaves and bracken stems surrounding it. Individual birds, it would seem, at any rate, to make assurance doubly sure, go so far, when fearful of discovery, as to throw dead leaves over the back. The late Lord Lilford, I believe, once witnessed a frightened bird perform this act. A more certain way of studying this wonderful assimilation is open to those who have the good fortune to discover the nest, for one has then but to wait and watch for the duties of brooding to be resumed. The young in down, it is significant to note, is clad in dull reds and black, but the pattern of the coloration, one is at first surprised to find, is arranged in longitudinal stripes—black stripes on a dull red ground. On reflection, however, one recalls the fact that for some as yet obscure reason, a striped livery is characteristic of young birds, at any rate of those which enter the world in a precocious condition ; so that we may regard the general dull red of the ground-colour as a later character, superimposed on an ancestral striped livery. The same factors, indeed, which have determined the general tone of the plumage of the adult have also governed the hue of the nestling.

Turning now to our Snipe, we find the three species all similarly coloured, and, it is needless to remark, they are birds of similar habits, though differing in certain details to be discussed presently. In all three, the most conspicuous feature of the upper surface is the presence of longitudinal yellow stripes, a median stripe down the head,

and four stripes along the back. In the common and great-snipe the back is further variegated with blotches of black, the rump has a marbled tracery of black, and the tail, when closed, commonly bears a more or less extensive patch of black near its tip, while the long inner secondaries are transversely barred with black, but, be it noted, the amount of black on the tail, and the barring of the inner secondaries, varies considerably, as also does the general hue, some being much darker than others. And these differences, at present at any rate, cannot be attributed either to age or sex. The great or, as it is also called, the solitary-snipe, differs in no important points in its coloration from the common-snipe. But it shows a similar tendency to vary, especially in regard to the barring on the flanks and the amount of the white in the tail, though these differences are not apparent till a large series of individuals is compared. The jack-snipe, in its general coloration, bears a striking likeness to its congeners, but on analysis many interesting points of difference become apparent. In the first place, the median yellow stripe along the crown, and the black area on the tail when closed, are wanting. These are markings which have probably been recently lost, but to this point we shall return. More important is the remarkable metallic lustre which the plumage has acquired. And nowhere is this more conspicuous than where we should least expect to find it—on the rump, which glows with a rich purple. The hinder scapulars, which are peculiarly elongated, have a long band of rich metallic green running down the free edge of the inner margin, while the black subterminal bar of the long inner secondaries is similarly ornamented. In like manner a band of purple runs along the outer margin of the submedian yellow stripe which courses down the back. The white under tail-coverts are probably also a later acquisition. In the common and great-snipe it will be remembered they are yellow and black.

This latter point, however, demands closer attention, and this because the common-snipe is said, like the woodcock, when resting, to crouch with its tail, instead of its head, to windward, the tail being

turned up and spread fanwise so as to shield the back and head. This being so, the dark-coloured under tail-coverts would have a decidedly protective value: white feathers, like those of the jack-snipe, would be conspicuous when so exposed. Finally, while the flank feathers in the common and great-snipe, as in the woodcock, are barred, in the jack-snipe they are longitudinally striped. What interpretation is to be placed on these differences? It would seem that the median yellow stripe along the crown is a feature which has been lost but recently, since traces are found to-day in some individuals of the species in an irregular rufous band which is soon lost by abrasion. But what are we to say of those losses and gains? Are they merely the expression points of variation, of no significance one way or another in the struggle for existence, or are they of selection value, and enabling their possessors to fare the more successfully in that struggle? What part do these stripes play in the life-history of the common-snipe? The snipe now under discussion, as we have already remarked, differ conspicuously from the woodcock, and agree among themselves, in the darker coloration of the upper parts, and the conspicuous, long, narrow, yellow stripes along the back; and these differences are almost certainly due to differences of environment. But be this as it may, the behaviour of the woodcock, and of the common-snipe at any rate, when striving to avoid detection is quite different. The woodcock crouches, the snipe depresses the head and tilts the body upwards till the tail is almost vertical, so that the yellow lines along the back simulate dead stems of reed and grass. One cannot, of course, suppose that the snipe is conscious of the pattern on its back and of the advantage gained by assuming this posture in moments of danger, but the correlation of the coloration and the bird's behaviour clearly points to some advantage in this particular pattern of the plumage. Nevertheless, it does not follow that this pattern is attuned so nicely to the environment that a little more, or a little less, of one or other of its components would endanger the bird's well-being. Indeed, a comparison of a large series, either of woodcock or Snipe,

will reveal a considerable range of variation in details of pattern and hue. Thus, then, the lack of absolute likeness between the jack-snipe and the common-snipe may be a matter of no great moment, albeit a further exaggeration of the differences which seem to have begun to make their appearance in the jack-snipe may eventually, sooner or later, throw the bird out of harmony with its environment, and so bring about, either its extermination, or a change of habitat and habit. But there are many details in the life-history of the jack-snipe which remain to be filled in before we can profitably carry speculation further. One point in this connection, which must not be lost sight of, is that in the common-snipe, in its immature dress, the longitudinal stripes are somewhat less perfectly developed; at any rate in so far as the external lateral, as distinct from the internal submedian stripes are concerned.

A comparison of the downy young of the snipe and woodcock is no less instructive, for, curiously enough, it reveals the fact that the young snipe resembles the adult woodcock in having transverse bars across the head, while the young woodcock resembles the adult snipe in having longitudinal stripes! But the stripes in the woodcock are black, and in the snipe are white. The young of all three species of Snipe, it is significant to notice, are practically indistinguishable, but that of the jack-snipe is perhaps the richest red in colour.

That the woodcock and snipe have attained to a high degree of specialisation seems to be shown by the fact that these birds display no seasonal variation of plumage. What answers to the "nuptial" plumage of so many of the *Limicolæ* has here become the permanent livery; and this interpretation is strengthened by the fact that not only are the sexes alike, but the young scarcely differ from the adults. Nowhere, perhaps, is the evidence of specialisation more strikingly shown than in the skull, which has undergone profound structural changes, as if in response to the probing movements of the beak. Without entering into minute details, it will suffice to say that the Snipe and woodcock stand alone among birds in respect of the

extreme shortening of the base of the skull, which has tilted the floor upwards, so that the cerebrum, instead of lying in front of the cerebellum, lies above it, or, in other words, the long axis of the brain, instead of running parallel with the long axis of the skull, runs at right angles to it. This bending downwards, and forwards, of the brain

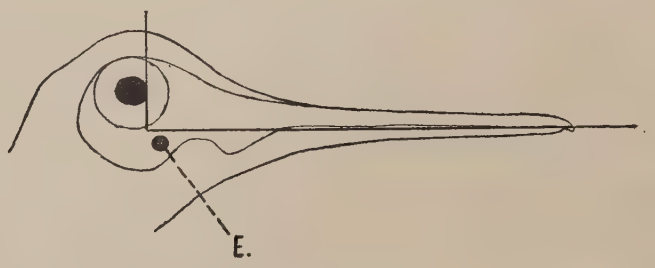

Fig. 1.—Woodcock.

cavity has been attended by a shifting forwards of the aperture of the ear. In say a gannet, or a gull, this aperture lies far behind the eye socket. In the snipe and woodcock it lies underneath it! A reference to the diagrams will make this clear at a glance. Thus it comes about

Fig. 2.—Gannet.

that if a freshly killed snipe be examined, the aperture of the ear will be found under the eye, but in the woodcock it has shifted still farther forwards, so that if a line be drawn at right angles to the long axis of the beak, and passing just inside the anterior border of the rim of the eyelid, this line will pass *behind* the aperture of the ear! (Fig. 1.) In this particular the snipe and woodcock are the most highly specialised of all birds. Finally, in the snipe and woodcock, in common with some other *Limicolæ*, *e.g.* dunlin, the tip of the upper jaw is strangely mobile, so that it can be raised upwards and brought down again in opposition to the lower jaw, thereby forming a

grasping organ of great sensibility. (Fig. 3.) But the manner of its use and the nature of the mechanism can best be understood when studied in relation to the bird's feeding habits, and accordingly these points will be referred to again in describing the mode of feeding in the woodcock.

Let us pass now to the consideration of these birds as living organisms, in relation to that environment which we believe has

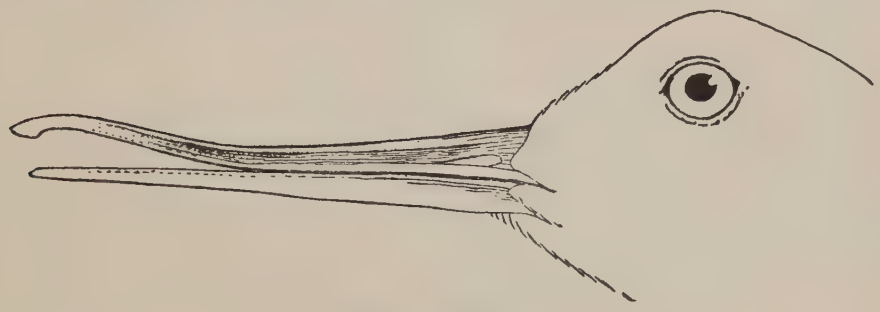

Fig. 3.—Woodcock.

governed both their coloration and their more deep-seated structural peculiarities.

2. THE WOODCOCK

[W. P. Pycraft]

As we have just remarked, the differences of coloration which obtain between the woodcock and the snipe are correlated with differences of habitat. The woodcock shows a marked preference for woods and coppices. Here, amid an undergrowth of bracken and bramble rising above a carpet of dead leaves, oak, beech and birch, or alder and hazel, or squatting on a bed of pine-needles, it rests by day, and here it broods its eggs. On bright warm days in winter, however, it loves to exchange the shade of the covert for the sunny side of a bank, which forms the boundary of the wood, and especially if this be planted with holly or laurel. Woods and coppice, however, are by no means indispensable to the well-being of this bird, for it will

contrive to find congenial harbourage amid low scrub and tussocks of grass, or heather and bracken on high ground, especially if there be springs in the neighbourhood, for these, so long as they remain open, afford a never-failing food-supply. But wherever it elects to shelter, there it remains during the day, venturing abroad to feed only as the light begins to fail.

That this bird is crepuscular in its habits might be at once inferred from the great size of the eye. Nevertheless feeding during dark nights is difficult. Under such conditions, indeed, a sufficiency of food is never obtained, thus necessitating an attempt to stay the pangs of hunger long before the usual feeding time. Small spiders, and insects found among the dead leaves, or amid short grass and heather stems, doubtless make but a poor substitute for a meal, but they cannot be despised by a hungry bird. On a light night, provided there be no frost, the bird fares sumptuously, for there is then no difficulty in procuring an abundance of worms, which seem to be the favourite and staple element of its diet. One can hardly suppose, by the way, that this fact is realised by those who profess a liking for woodcock cooked with the "trail": they live apparently in a state of blissful ignorance of the fact that woodcock and snipe do *not*, as our forefathers fondly believed, live on "suction"! But to return to the diet of worms. To obtain this luscious meat the woodcock occasionally poaches in the preserves of the snipe; but, as a rule, the feeding-grounds do not coincide. The woodcock rather prefers springs, often on high ground, and damp spots in woods, while ditches and hedgerows are also explored. Its method of capturing its prey is exactly the same as that of the snipe, the long, tapering, and highly sensitive beak being thrust into the soft ground like a probe. Often, before the thrust is made, the bird stamps with its feet, and turns the head sideways, after the fashion of a thrush, to catch the low grating sound caused by the movement of the bristles of the worm against the sides of its burrow. Having located its prey, the fateful thrust is made and the victim drawn out. Not always, however, does success

Woodcock on its nest

By A. W. Seaby

attend the thrust. How thoroughly the ground is searched is attested by the holes which riddle the ground where woodcock and snipe have been feeding. These show that the bird commonly walks a few steps, then thrusts all round him, leaving a semicircle of holes at each stopping-place.

But besides worms, and the insects, Crustacea and small Mollusca picked up among dead leaves, it does not seem to be generally known that woodcock are by no means averse to searching the patches of cow-dung common in their haunts. On this subject Mr. G. Brooksbank, a keen and most observant ornithologist, writes me that the presence of woodcock in the neighbourhood can always be detected by the marks of their peculiar proddings in such patches. These proddings "can always be distinguished from those of the curlew, snipe, rooks, and starlings—or even the little hole made by some tiny bird, I think a wren. This is one of the lessons that a woodcock shooter must learn early, and also to recognise their droppings—and many keepers miss these signs of woodcocks' presence."

But it is not enough to say that the victim is caught by thrusting down the beak into the soil, for in the first place, as we have already remarked, the search for food is accompanied by a stamping of the feet, and this is followed by rapid movements of the beak backwards and forwards, at the end of the thrust, a fact which seems first to have been noticed by Macgillivray.[1] This is a peculiarly interesting observation, for most of us know that worms are strangely disturbed by the rotatory movements of a stick thrust into the ground, which will invariably, sooner or later, bring worms to the surface all round the seat of disturbance. Nor is this all, for the actual capture is dependent in part upon the sensitiveness of the tip of the beak, and in part by a curious mechanism of this tip, which, it may be remarked, is shared also by the snipe and dunlin and other *Limicolæ* which obtain their food by probing. Briefly, when the thrust is made the beak is closed, at the end of the thrust, by the

[1] Macgillivray, *British Birds*, vol. iv. p. 392.

action of small muscles attached to the quadrate bone, the long slender rod which forms the lower border of the bony framework of the upper jaw is driven forward, a movement which has the effect of driving the last inch upwards, so that the worm is caught, as it were, in a cleft stick. As soon as the sense of touch shows that the worm is in position, the raised tip is brought down upon the lower jaw and the prey is held, as by a pair of forceps, and drawn out. The same is true of the snipe and some of the Waders. (Fig. 3.) It is clear that some such mechanism is necessary for this method of feeding, since, if the beak were thrust open into the soil, it would be filled therewith: while if it were thrust in closed and lacked the mechanism just described, the muscles of the jaws would not be strong enough to force away the soil along the whole length of this slender probe. It is certainly strange that these curious movements of the beak should not be more widely known to-day, the more so since they are at any rate briefly referred to in so well known a work as Yarrell's, wherein some remarks on the subject by the late Henry Stevenson are quoted. He remarked that "the flexibility of the upper mandible of the bill is so great that it more resembles the writhings of a worm than a beak, and this voluntary upward movement, added to the exquisite sense of touch possessed by the anterior portion of the beak, assists the bird in obtaining its food."

The gape of the woodcock and snipe, as everybody knows, is very small, so much so that the passage of a large worm completely fills it: thus it happens that soil adhering to the body of the worm is scraped off by the rim of the mouth and there tends to accumulate. To prevent such disagreeable consequences, both woodcock and snipe are said never to feed far from water, in order that they may frequently wash away the offending matter.

In leaving and returning to its feeding-ground, the woodcock displays curiously methodical movements. As the twilight settles down the bird rises silently, as if mindful that most of the dwellers in its wood are asleep, and flits down some glade or ride in

the covert, keeping near to the ground till it reaches the open, when it suddenly rises to a considerable height, and at great speed makes for its favourite marsh or swamp, dropping suddenly like a stone when this is reached. With the coming of dawn a return is made to the favourite wood. But first it wheels about for a short space, often uttering a peculiar cry: and after a few turns it suddenly rises high in the air and makes a bee-line for the covert, descending with a sudden swoop, and darting along the glade by which it left, speedily settles down in its accustomed resting-place.

It is a curious fact, remarks Mr. De Visme Shaw,[1] but "in every wood or covert favoured by woodcock there is always a certain opening, generally the end of a ride, by which the birds leave and re-enter their home. . . . It seems the more curious when we consider that cocks do not leave the covert together, but always singly, one after another. Between the time of the exit of the first bird . . . and that of the last, there is never an interval of more than a quarter of an hour or twenty minutes. As our forefathers set their cockshut nets at these openings, and waited for the flight of the cock, so do certain moderns who shoot for the pot, or the pocket, take up their stand at the same dusky hour. After ascertaining which opening in the wood is used by woodcock, one may, if anything of a flight shot, account for nearly every bird."

The only things that seem to disturb the even tenor of the woodcocks ways are a spell of sharp frost or continued wet. Heavy rain, or even "Scotch mist," sooner or later causes the trees to drip, which apparently occasions the bird great discomfort, for it will promptly shift its quarters to open ground. Frost is still more disconcerting. Bog and water-meadow now cease to yield their supply of worms, and the famishing bird is driven for food to the drains in the deepest hollows of the wood, where diligent search among the dead leaves may provide small snails and insects. Night hunting is now impossible, and the day rarely yields a full meal. Should the frost continue, a general

[1] *Snipe and Woodcock*, Fur, Feather, and Fin Series, p. 136.

exodus takes place to the coast, when a sufficiency may haply be found among the seaweed in the shape of small mussels and Crustacea. Even there the icy grip of winter may take hold, when, as a last resource, a general westerly movement to the southern counties of England, and across to the south and west of Ireland, is made. Along the latter, in exceptionally severe winters, woodcock swarm, and even there may perish miserably. During the frost and snow of 1867 hosts of woodcock were to be met with in Killala Bay feeding among the seaweed. The birds lay among the rocks and large stones, and were killed by the country people with sticks. Again in 1881 Sir Ralph Payne Gallwey saw 800 woodcock laid out on benches together at Tralee, where over 2000 woodcocks and 9000 snipe were received by one firm of game-dealers. In that season 560 fell to one gun in Co. Kerry, while in Co. Clare one dealer alone, though he had two rivals in the trade, forwarded to Dublin and London a thousand cock a week for three weeks.

So much for what we may call the daily routine of the woodcock's life, and for the causes which occasionally break the orderly sequence of events. Let us turn now to that period of exaltation and unrest which annually precedes the sterner discipline of parenthood.

While remarkable for its solitary habits during the greater part of the year, the woodcock when under the influence of sexual excitement displays a decided capacity for social intercourse; a common impulse breaking down the usual observances. Some interesting facts concerning woodcock at this period we owe to Mr. Pentland's[1] observations on breeding birds at Glenstal, Co. Limerick. From him we learn that in favoured spots it is no uncommon thing to see from twenty to thirty birds flying about the woods and glades, chasing one another and calling excitedly. The approach of the birds, says Mr. Ussher in that delightful book *The Birds of Ireland*, is usually announced by notes of two sorts, which are uttered on the wing. There is a croak, often repeated thrice, which has aptly been compared to the words "more

[1] Thompson, *Birds of Ireland*, vol. ii. p. 243.

rain to-morrow" uttered in a croaking voice, or by others compared to "*croho, croho.*" "I have seen the bird's body," he remarks, "deflected at the third croak, while outlined against the sky." The other note which often immediately follows the croak is a chirping screech, which has been likened to "*chizzie.*" Mr. Pentland is convinced that both sexes croak and call, since when woodcock are flying about in this way every one is calling, and females as well as males must be on the wing. Mr. Moffat, another well-known Irish ornithologist, furthermore states that when they are thus playing about two may frequently be seen to dart alongside each other for a few hundred yards, chirruping loudly and excitedly as if in defiance. These flights one is not surprised to find take place both at dusk and dawn during the spring and summer. This peculiar aerial performance is known as "roding." The flight at such times is comparatively slow and straight, and is accompanied by a puffing out of the plumage, giving the actors an exaggerated bulk. This "roding," or "roading" as it is sometimes called, is commonly regarded as representing all that takes place during the courtship of the woodcock, and answering to the drumming of the snipe. But those who have read Mr. De Visme Shaw's most entertaining account of this bird[1] will have gathered that this is by no means the case. For he tells us that "During the period of courtship, and while the female is sitting, the male woodcock displays daytime activity which is never evinced at any other period of the year. When courting the lady of his choice, he is fond of strutting about with drooped wings and spread tail, and with the feathers of head and neck puffed out to their uttermost. As soon as his mate begins to sit, he will spend the first hour or so of daylight in flitting up and down the ride or open space near which the nest is situated, uttering meantime a cry which may be likened to '*whe-e-esp,*' and at intervals giving voice to a second cry resembling the monosyllable '*lvee, lvee*': while this lasts, he looks, with the puffed out feathers of neck and head, for all the world like some strange, long-beaked owl.

[1] *Snipe and Woodcock*, Fur, Feather, and Fin Series, p. 132.

The morning serenade over, he indulges in a lengthy rest, after which, towards the close of the afternoon, he goes through the same performance."

That there is a considerable variation in the notes of the woodcock at this time seems evident on a comparison of Mr. Shaw's notes with those of the observers already quoted. It may be that the sound varies with the environment; that is to say, it may acquire a greater volume under certain atmospheric conditions, or when uttered in an open space, or in the vicinity of hills.

To return for a moment to the "roding," or "roading" as it is sometimes called. Not the least remarkable part of this strange performance is the routine which is observed. At dawn and dusk alike the same ground is traversed, almost, we might say, rhythmically. Commonly the path traversed forms a rough triangle, the sides of which may be a quarter of a mile or more in length. "In England," remarks Professor Newton, "in former times advantage was taken of this habit to catch the simple performer in nets called 'cockshuts,' which were hung between trees, across open glades or rides in a wood."[1]

From the phases of courtship we pass to that which concerns the care of the young. This begins with the preparation of the nest and brooding of the eggs. As to the former, enough has been said already

[1] This practice of netting, however, it must be remarked, was not alone employed for the capture of love-sick birds, but was even more extensively employed during the winter months in taking birds as they left the shelter of the woods for their feeding-grounds; for, as will already have been gathered, these birds are curiously methodical in their habits throughout the year, leaving and entering the woods by regular routes. A little preliminary observation on the part of the snare-setter would soon disclose these routes, and the rest was easy. That this practice is one of hoary antiquity is witnessed by the references thereto in literature. So common was the custom, that the hour of twilight was known as "cockshut time." "The falling of the net," remarks Mr. De Visme Shaw, "shut in the cock; hence the net used for taking the birds became known as a cockshut, and the time of using it as cockshut time." English literature is full of references to this word. Shakespeare, for instance, writes:

> "Thomas, Earl of Surrey, and himself
> Much about cockshut time went through the army."

And Ben Jonson has:

> "Mistress, this is only spite—
> For you would not yesternight
> Kiss him in the cockshut light."

(p. 129), but special mention may be paid here to the marvellous way in which the coloration of the plumage harmonises with the bird's surroundings. Mr. H. B. Macpherson, in some interesting notes contributed to the pages of *Country Life* during 1908, makes some valuable observations on the brooding habits of the woodcock. "Its hearing is abnormally acute," he writes, "and the first unusual sound has the effect of keeping the bird in whatever position it may happen to be, a repetition of the noise causing it to lower itself gradually to the ground, the bill pressed into the moss and the body extended flat on the ground, the tail also being lowered." For some hours every day during a whole week this bird was kept under observation. "During the severe frosts towards the close of April she stuck to her post with marvellous fortitude, though other birds were deserting their nests all around. When leaving the nest she made no attempt to conceal the eggs, the dead leaves of the birch and poplar which surrounded them making this precaution quite unnecessary. . . . Her absence from the nest during the day became more prolonged as incubation proceeded. On one occasion she was feeding and preening herself for three hours and a half close to my shelter; but this seeming carelessness had no ill-effect whatever upon the eggs, three out of four being successfully hatched. On one occasion she found a worm and devoured it leisurely, with beak turned skywards, but for the most part her diet consisted of such minute creatures that they were invisible at a distance. Of these she evidently found a plentiful supply among the dead leaves and bracken, although the weather was bitterly cold. At intervals she would come and inspect the eggs to see that all was safe, and, satisfied, would again resume her feast. On occasion she would disappear entirely, no doubt for water, there being little in the vicinity. When coming to the nest the woodcock approaches cautiously, listening for the least sound which may betray the presence of an intruder. If satisfied, she fluffs up her tail feathers over her back, and settles on to the eggs. . . . She then gradually lowers the tail, sinking down contented to the usual position."

We do not remember to have seen any other account of the way in which the woodcock turns its eggs than Mr. Macpherson's. In this operation, he tells us, the beak plays no part, but the egg is invariably grasped and turned with the foot, aided by a shuffling movement of the body.

The whole work of incubation seems to fall entirely on the female. At any rate, during the week's vigil just described, the male was never once seen, though he may have visited his mate during the night. On the other hand, Mr. de Visme Shaw tells us that when resting during the day he selects a position never more than a few feet away from the nest. And this would seem to be further evidence that he takes no active part in the work of incubation. But according to Naumann (see p. 129) he relieves his mate for a short space during midday.

The halcyon days of brooding over, the anxious work of providing food for the young begins. But as to the manner in which this provision is made, the most widely divergent statements have been made. Knowing this, it is somewhat remarkable that no ornithologist has undertaken the task, albeit a hard one, of setting the matter at rest. It is to be remembered that the woodcock commonly nests in areas more or less remote from its feeding-ground; wherein it differs from nearly all other birds whose young enter the world in a precocious condition. According to some, one or both parents bring food—generally worms—to the nest, or at any rate the nesting area; and Sir Ralph Payne Gallwey, according to Yarrell,[1] "has observed that woodcocks have a curious habit of placing near the edge of the nest a little bank of moss, on which they will at times deposit worms as they bring them, that the young may learn to pick them out as they quickly glide from their view." This may be so; and the young may also obtain a portion of their food, at any rate, under the guidance of the parents, from among the dead leaves in the vicinity of the nest, for we know that the adults, when need presses at any rate, contrive to find food after this fashion. On the other hand, a number of

[1] *British Birds*, vol. iii. p. 329.

responsible observers—and they are too numerous to mention individually—affirm that the young are carried by their parents down to the feeding-grounds at night and are brought back again in the morning. Dr. F. D. Godman, an ornithologist of no mean repute, avers that in the Azores this practice is a matter of daily occurrence.[1] There is no need, surely, to-day, to recapitulate the controversy, which has been waged through long years, as to whether woodcock do or do not carry their young. There can be no doubt about the fact. One cannot, however, speak with the same assurance as to *how* this feat is performed, but it seems certain that the fond parents will perform this office for their young even after they are big enough to bear the burden of their own bodies. Scopoli, so long ago as 1769, says, "*pullos rostro portat fugiens ab hoste*," whereon Gilbert White remarks that "the long unweildy bill of the woodcock is perhaps the worst adapted of any among the winged creation for such a feat of natural affection." Nor does the bird bear her living load held between the bill and the breast, nor between the thighs and pressed against the breast by the beak, but suspended by the feet. This at any rate seems to be the correct interpretation of what obtains according to the testimony of Mr. Moffat, an Irish naturalist of considerable experience. On this subject he wrote, in the *Irish Naturalist*, 1899, "On the morning of April 19, the female, as I approached, sat closer than had been her wont, and on rising I was almost immediately struck with a curious yellowish object that seemed to hang from between her legs. The bird's flight was slower than usual, and her long bill was plainly seen to be directed forwards, in the ordinary attitude, and not in any way used to steady or support the object carried." The late Duke of Beaufort, so long ago as 1850, when in the New Forest, came upon a female woodcock watering her three young ones at a rivulet. She picked up "one in each claw" and flew off with them. "I hid in a high gorse brake close by, and saw her return in four or five minutes and pick up the remaining bird also in her claw." Mr. De Visme

[1] Pycraft, *A History of Birds*, p. 225.

Shaw, from whose work the above extract is taken, remarks that in his opinion "the way a woodcock starts is . . . to grasp, say, the left wing of the young bird near the body with, say, the left foot and then to spring off the ground on the free foot, afterwards using the free foot to grasp the young bird's other wing."

At times, however, in the face of danger the parents behave quite differently. Instead of bearing their young off to a place of safety, they adopt the more usual method prevailing among birds of feigning injury and so drawing pursuit upon themselves and away from their young. Perhaps the device is adopted when surprised too suddenly to enable them to seize the offspring. There are records innumerable of the behaviour of the woodcock under these circumstances, and as an example thereof we cite the account of Mr. Ussher,[1] who remarks, "If an intruder approach the young the parent bird will fly round instead of away from him; and when its alarm is strongly excited, as by the presence of a dog, a woodcock will utter outcries that have been compared to the screaming of a hawk, and tumble on the ground before the object of its apprehension. I was informed by my late gamekeeper, Richard Wolfe, that when he was walking with beagles through a wood where these birds were breeding, one of them alighted in front of a dog, and running forward, flapped its wing at the animal with loud cries." Similarly, St. John[2] remarks, "When disturbed from her nest, she flutters away like a partridge, pretending to be lame, in order to take the attention of the intruder away from her young or eggs."

The subject of migration having been dealt with earlier in this section, little need be said on this theme here. But a few points are worthy of comment. In the first place, the immigrant woodcock, which arrive on our shores during October, attract more attention than the emigrants, which seem to steal away unobserved. The arrival of the immigrants excites no wonderment, for vast hosts of birds of all

[1] *Birds of Ireland*, p. 274.
[2] *Wild Sports of the Highlands*, p. 248.

species seek our islands at this time, thereby escaping the terrors of a more northern winter. But why do the emigrants, the birds which have bred with us, leave? If the birds bred farther north can find sustenance here through the winter—though they may be driven farther and farther southwards and westwards during spells of exceptionally hard frost—why cannot our own native birds endure the same climatic conditions? During recent years, it may be remarked, they have considerably increased in numbers, owing in part to the increase in plantations, and in part to the shelter they obtain within the closely guarded coverts which form their favourite resort. The reply which naturally suggests itself is, that the more northern birds are more inured to cold than those bred in our islands, which at the approach of winter leave to seek more southern latitudes. But this is not a quite satisfactory explanation; the answer to the riddle has yet to be found.

Like most migrants travelling by night, these autumn arrivals land on our shores unseen. But there is reason to believe that they observe the usual rule of migrants, of crossing the sea at a great height, and pitching down suddenly as they reach the shore. Unfavourable meteorological conditions, however, in the upper air, often drive the travellers downwards, when many, attracted by the glare of lighthouses, perish miserably. On moonlight nights, however, this danger is largely removed. But that the numbers which annually meet a violent death through this irresistible fascination for light, the reports of the Migration Committees amply testify. Thus Mr. Barrington, to quote but a single instance, tells us[1] that when overhauling the Copeland (New) Island Lighthouse, on May 12, 1891, no less than one hundred and fifty dead woodcock were found in the "eave-gutter" of the dome and cowl of the lantern: these must have been killed by striking the lantern during stormy weather in the spring. During migration, birds have been seen to rest for a while on the sea, and rise again to resume their journey. During adverse weather,

[1] *Migrations of Birds at Irish Light-Stations*, p. 246.

however, they would seem to fall into the sea from sheer exhaustion. Thus Mr. Falconer, of Christchurch, has recorded [1] the fact that "some years ago, a few miles from the Land's End, the sea was strewn with hundreds of dead woodcock."

3. SNIPE

[W. P. Pycraft]

The distinctions and peculiarities of plumage of the three species of Snipe which are to be met with in the British Islands have already been discussed at sufficient length: it now remains to epitomise their life-histories.

Though all, apparently, obtain the bulk of their food by probing, none have undergone such a high degree of specialisation, to facilitate this method of feeding, as is seen in the case of the woodcock. This is a curious and interesting fact, which demands further study. It would seem that we must assume, either that the woodcock probes more, is more dependent upon the capture of food after this fashion than the snipe, or that the peculiar "telescoping" of the long axis of the skull, having proved a useful variation, has, in the woodcock, reached, so to speak, its logical conclusion, while in the snipe it is only on the way towards this consummation. It is significant to remark in this connection, that this shortening of the long axis of the skull is least conspicuous in the jack-snipe, which seems to be less dependent on its probing powers than its congeners, being able to subsist to no small extent on a vegetable diet. It was commonly supposed, indeed, that neither the woodcock nor the common-snipe showed this ability to turn vegetarian at need. This is not so, as Newstead has shown (see pp. 133-135); and I have just dissected a common-snipe whose gizzard contained several seeds of the bog-bean

[1] *Zoologist*, 1848, p. 2023.

(*Menyanthes trifoliata*) as well as a quantity of comminuted vegetable matter, but whether this forms any considerable part of the diet of these birds remains to be seen; so far as the evidence goes, they do not seem to take kindly to a vegetable diet. Finally, the jack-snipe has relatively the shortest beak. Thus, though perhaps the most highly specialised in regard to its coloration, it is apparently the least specialised in regard to its food; and the advantages gained thereby are apparent during hard weather. Then the woodcock, great, and common-snipe fare badly. Not so the jack; when his cousins are reduced to mere skeletons, the jack still remains plump and in good liking, grass, various kinds of seeds, and moss furnishing him full meals while his neighbours starve.

Frost drives the "full" or common-snipe, like the woodcock, to the coast, where it contrives, for a while at any rate, to eke out a living in company with small Waders, but unless a thaw sets in speedily they die in large numbers. The mortality at this time would be far higher but for the fact that the majority of the birds affected seem to make a general rush for the south and west of Ireland, where enormous numbers find food and shelter till the time of stress is past. Ireland, however, at all times, is the most favoured of our islands by snipe, which breed there in large numbers. "The winter visitors," remarks Mr. Ussher,[1] "are believed to be distinguishable by colour and markings from the birds reared in this country, which are greyer." This may well be; the point is worth more attention than it has obtained.

But to return to the subject of feeding. Snipe, like woodcock, possess a ravenous appetite, and lose flesh rapidly if the supply of worms, their staple diet, is cut off. With a thaw the worms rapidly make their way to the surface, and the snipe then feast, and gain fat again as rapidly as they lost it. This inability to sustain long fasts, where the diet is largely made up of worms, is exemplified again in the case of the mole, which is unable to fast longer than a few hours. As to the

[1] *Birds of Ireland*, p. 278.

way in which the common-snipe disposes of a worm, accounts differ. On the one hand, Mr. De Visme Shaw tells us it is seized by the middle and sucked through the "compressed mandibles, the pressure eliminating the slimy earth, which adheres to the bill and hardens rapidly." Continuing, he remarks: "The snipe will spend many minutes cleansing his beak after feeding at a distance from water, and he usually has a thorough wash and brush up before resuming his meal." But Mr. Hugh Wormald,[1] who, having succeeded in rearing a tame common-snipe, had exceptional opportunities of observation as to the way in which worms were disposed of, tells us that his bird, having seized a worm, "sucked it down with no apparent exertion." When swallowing, the head was not thrown back, but the neck was stretched out and the beak pointed downwards. If the worm was too large to be swallowed readily, it was hammered and pinched till broken up. The worms known as "brandlings" were always refused, and this because of their offensive smell, or perhaps taste, for it only distinguished between raw liver and worms when they were nipped between the mandibles. Sight seems to play but a secondary part in securing food, for this bird was unable to see a worm "right under him." If two or three were placed before him, he would walk up and feel about for them with his beak. The larvæ of daddy-longlegs were also greedily eaten, and so also were maggots. These last wild snipe have been known to obtain by probing in the carcasses of dead animals. While feeding, this bird kept up a continual twitter. Sand and small pebbles were constantly swallowed, and the grinding of this in the gizzard could be heard distinctly at a distance of several feet, especially just after feeding. This action seemed to take place rhythmically, about twelve times per minute. The hearing of this bird was very acute. It was often observed to listen like a thrush, when, after a moment or two, it would suddenly plunge down the beak into the soil and bring up a worm.

In its feeding-habits the great-snipe does not apparently differ

[1] *British Birds* (magazine), ii. 249.

from the common-snipe, and, similarly, its haunts are the same. Having regard to the coloration of the two species, and their similarity in structure, this agreement is what we would expect. On the other hand, when we come to compare the common, great, and jack-snipe in regard to their breeding-habits, we find a striking diversity in place of agreement.

In regard to the courting habits of snipe, we have certainly a great deal to learn. A hint of this fact may be gleaned from Mr. Wormald's notes on his tame common-snipe, to which reference has already been made. He remarked that in the spring his bird made a kind of "display," by walking round and round his hand and uttering "the spring note," meanwhile spreading the tail fanwise, and "gently poking my hand with his beak." He would also constantly play by himself, standing bolt upright, then squatting down flat with his tail raised and spread fanwise. Then he would suddenly take two or three jumps to either side with closed wings. After going through this performance some half-dozen times on end, he would stop, and stroll leisurely off. The fact, however, that this bird, during these proceedings, would often squat down flat on the ground, with the neck stretched out and tail raised, has led Mr. Wormald to entertain suspicion that his captive may after all be a female. Of this behaviour, however, few have any knowledge, the "courting" of the snipe being associated in the minds of most of us with a very remarkable aerial display, which is always accompanied by very peculiar sounds, known either as "drumming" or as "bleating," in which, however, it would seem both sexes participate, though the male continues to perform till after the young are hatched. This display may be described as a "musical ride," wherein the bird ascends to a height of about 300 feet, then describes a series of wide circles, dropping, at intervals, some 50 feet or so, with a steady, tremulous, side-long fall, and at reduced speed. Each descent is accompanied by the strange high-pitched notes, likened by different observers to "drumming," "bleating," and "neighing." That they are diffi-

cult to describe none who have heard them will deny. To me the noise produced would be more correctly described as "humming." If one happens to be near, the sound is in a higher key, and a likeness can certainly be detected to the bleating of a goat. As a rule this music begins soon after daylight, and may be continued for a couple of hours or so. At midday it begins again, and is sustained for a like period. Just before sunset it is once more resumed, and lasts till the twilight has given place to darkness. Often, indeed, when fine, especially on moonlight nights, this concert will be kept up, intermittently, throughout the night, as many as a dozen birds contributing at a time.

As to the means whereby this strange piping music is produced, opinions at one time differed widely. But there is now no need to traverse all the theories which have been advanced since this matter first engaged the serious attention of ornithologists. The solution of the mystery is due, strangely enough, to an accident. The German naturalist Naumann, some years ago, took up this problem, feeling convinced that the sounds were not vocal. He surmised that they might be due to the vibration of the wings, and to test his assumption he fastened some of the primaries of a snipe to a stick and moved them rapidly through the air, expecting to reproduce the sounds. The experiment failed, and there, so far as he was concerned, the matter ended. But in the published account of the experiment, by some fortunate mischance tail feathers were stated to have been used instead of primaries. The Swedish ornithologist Meves, a year or two later, reading this account, tried the experiment himself, using, of course, tail feathers, and at once solved the problem!

Later ornithologists, however, refused to accept this interpretation, and averred that the primary cause of the sounds was the vibration of the wings, aided, perhaps, by the outspread tail. The matter, however, was finally set at rest by some experiments of Dr. Philip Bahr. He pointed out[1] that during the descent to which

[1] *Proc. Zool. Soc.*, 1907, p. 12.

Common-snipe crouching
By A. W. Seaby

reference has just been made, the tail is widely spread, and that the outermost pair stand distinctly apart from their fellows. Further, he showed that this pair of feathers is peculiar in that their shafts are unusually thick, and strangely bowed, while the vanes of the inner web are thicker and more powerfully held together than in the case of those of the other feathers. Mr. Bahr's experiments are carefully described, and at great length, in the essay just referred to, so that space can only be found here for a summary thereof. Briefly, those who will may readily test for themselves the truth of his contention that these tail feathers alone are concerned in the production of the "bleating," and this by inserting the feathers into a cork attached to a stick of some six inches long, to the other end of which is affixed a long string. The apparatus is then whirled round, when, after a few turns, the characteristic sounds are produced. Care should be taken, in reproducing this experiment, to see that the outer web is so placed as to encounter the resistance to the air, and that the feather is affixed to the cork by a pin, so as to prevent any displacement of the requisite angle in regard to the wind. Mr. Bahr satisfied himself that both sexes "drum," when one day he came across a patch of ground tenanted only by a pair of snipe, which had newly hatched young, in hiding. He then observed both parents repeatedly drumming above him.

Having satisfied himself as to the sound-producing apparatus in the common-snipe, Mr. Bahr proceeded to examine and experiment with the tails of a number of other species of Snipe—a dozen species in all,—of which the tails of nine produced bleating sounds, in varying degrees of intensity, when treated after his method. Some of these were known to "bleat" during life, while of other species no observations seem to have been made. But it is a curious thing that in a considerable number of species, more or fewer—from three to nine pairs—of the outer tail feathers are more or less conspicuously attenuated, and this attenuation reaches its maximum in *Gallinago stenura*, wherein these feathers are little more than "pin-feathers."

This species has from twenty-six to twenty-eight tail feathers! and of these the eight outermost are thus strangely modified.

The duties of incubation seem to be undertaken mainly, if not entirely, by the female common-snipe; but the male bears his share in looking after the young. If suddenly surprised while brooding her young, she will leap up in the air, and descending will lie for a moment with extended wings and tail uttering plaintive whining notes, and then will flutter away, as if feigning injury. Having gone to what seems to her a safe distance, she will take wing and often alight on some post, or low bough of a tree, as affording a better lookout from which to watch the intruder, the while she keeps up an incessant "*chack-hach, chack-wach, chack-a-a-a-h chack, a-a-a-h,*" the beak moving during this time like the blades of a pair of scissors. These notes differ conspicuously from the usual "*scape*" uttered at the moment of flight, and when surprised at other times of the year. This bird does not, like the woodcock, carry its young, nor, indeed, do any of the snipe appear to adopt this method of conveying their young to safer retreats when danger threatens. Perchance this habit arose among the woodcocks as a result of their custom of carrying their young to and from their feeding-grounds when these are remote from the area of the nest.

And now as to the so-called "solitary" or great-snipe. Unlike its near relative the common-snipe, it does not "drum" in the proper sense of the word. Dresser[1] tells us that the great-snipe, or "double-snipe," has a "so-called 'ley' or 'spil' like some of the Grouse tribe, a sort of meeting-place, where they collect to 'drum,' and often to engage in combat for the possession of the females . . . It does not indulge in aerial evolutions, but remains on the ground . . . The male bird utters a soft, almost warbling note, which is accompanied by a peculiar snapping sound caused by striking the mandibles together several times in quick succession. If a person approaches one of these drumming-places, he can hear at some distance the low note;

[1] *Birds of Europe*, vol. vii. p. 635.

'*bip, bip, bipbip, bipbiperere, biperere,*' and when within one hundred paces, if the night is still, he begins to hear other peculiar sounds. . . . Whilst producing these notes the bird is in ecstasy, and raises and spreads its tail like a fan, the outer tail feathers showing in the half-darkness like two white patches." Dresser's remarks seem to have been based on observations of the Norwegian ornithologist Collett, who remarks[1] that in addition to the "bibiperere" notes the bird also makes sounds like the smacking of the tongue, produced by striking the mandibles smartly and rapidly together. He then jumps on to a tussock of grass, puffing out his feathers, spreading his tail, and drooping his wings before the female, the while uttering a tremulous "*shirrr.*" Seebohm,[2] who studied this bird at first hand in the valley of the Kureika, N.E. Russia, remarked also that these birds are gregarious during the breeding season. "Late one evening," he tells us, ". . . drifting down the Petchora, we came upon a large party . . . making curious noises with their bills in the long grass on the banks of the river." Their manner of producing these noises, he discovered later, was accompanied by strange movements of the head and neck, the latter being stretched out, and the head thrown back "almost upside down"—after the fashion of a white stork when "clattering"—the beak being the while rapidly opened and shut, and emitting a sound like that produced by running the finger along the edge of a comb. This outburst was sometimes preceded by a short flight, or by spreading the wings and tail. On the subject of this flight, which seems to be a part of the performance overlooked by Dresser, Seebohm tells us that he came on as many as half a dozen on the wing at once, but their flight was very short. He succeeded in shooting ten of those thus engaged, and all proved to be males.

Had Seebohm been more anxious to observe than to shoot, he might have anticipated the interesting observations of the Russian naturalist Alphéraky,[3] who seems to have collected more evidence as

[1] Yarrell, *British Birds*, vol. iii. p. 336.
[2] *Birds of Siberia*, p. 358.
[3] *Field*, 1906, p. 1075.

to the behaviour of the great-snipe at this critical period than any one else.

This bird is, he asserts, polygamous, and assembles at certain favourite spots to execute a performance hardly distinguishable from that of the black-grouse, and known among Russian naturalists as the "Tok" (fight). This begins at sunset and lasts till sunrise, the males only participating. They begin with a series of dances which gradually turn into violent fights, severest, apparently, during the darkest hours of the night, since after such encounters the ground is often found strewn with feathers. There is surely, however, some error of observation here, since "during the darkest hours of the night" severe combats would be hardly possible. But be this at it may, the fighting is preceded by display, when the tail is fanned out and turned over towards the back, while the head is commonly drawn downwards and backwards into the shoulders, and the wings half expanded and drooped. Thus posed the birds prance about, turning half round to right, then to left, slowly at first, then quicker and quicker, till, moved to frenzy, they begin to jump wildly and perform other ridiculous antics. Then comes the fighting. At about midnight the females, who till now have remained screened by the long grass, appear. The males stop fighting and again display, then renew the fighting till dawn, when the females fly off each with a male in attendance. Remaining paired for the day, they assemble again at dusk for a similar performance. At sunset the females set up a croaking noise like frogs round the tourney-ground to attract the males, who then assemble, and assuming the "toking" attitude, produce extraordinary sounds like the noise produced by drawing the nail along the teeth of a comb, which in turn is followed by a hollow sound made by the wings.

There are points in this account which challenge criticism, but it is, nevertheless, the most complete that has yet been given.

The jack-snipe, like the double-snipe, does not "drum" after the fashion of the common-snipe and its congeners, nevertheless it pro-

duces sounds which all observers agree are hard to regard as vocal, though there is no evidence to show that they are otherwise. The first to bring us news of the breeding-grounds of the jack-snipe, and of its behaviour at this time, was that enthusiastic egg-collector Wolley, who had the great good fortune to discover the secret which this bird had so long kept inviolate. The day, June 17, 1853, is a memorable one in the annals of ornithology. He was out on the great marsh at Muoniovara, egg-hunting, when his attention was arrested by a strange and unknown note. His servant suggested it might proceed from a capercaillie in the neighbouring forest, but he soon found it came from a small bird careering at a wild pace high over the marsh. He describes the note as the love-song of the jack-snipe, clear and hollow, a quadruple note, not unlike the distant canter of a horse over a hard hollow road,—a weird note which Naumann likens to the click of a death-clock. Naumann, it is remarked, never saw the bird in its breeding-quarters, whence we may infer that these sounds are not exclusively confined to the breeding season. Of its brooding habits and the care of the young we know nothing.

Of the courting habits of the great-snipe and jack-snipe our knowledge is very scanty; still less of positive knowledge seems to have been recorded of what we may call the everyday life of these birds. Yarrell tells us that the great-snipe "prefers drier ground than its congeners, and is found in dry grass fields, heather, potatoes, barley layers, and turnips, and that its flight is steadier and heavier than that of the common-snipe. Harting[1] similarly remarks, "It appears to seek drier situations than does the common-snipe—*e.g.*, one shot by the Earl of Huntingdon *in a dry grass* field near Mellerstain, Berwickshire, . . . two *on high ground*, Malham, Yorkshire, Sept. 6, . . . one on a stubble at Stewarton, Ayrshire, Sept. 15, . . . one in a piece of potatoes *on dry sand*, Wilts, Sept. 23, . . . one on a *dry bean* stubble at Thorpe, Northants, . . . one in a field of clover, Sept. 3." All these birds, it will be noted, were killed before hard weather had set

[1] *Handbook of British Birds*, p. 197.

in—they were not *driven* there by stress of weather. Yet they may have merely been taking cover, and not feeding there, just as the woodcock rests remote from its food source. Seebohm, who wrote on a first-hand acquaintance with this bird in Siberia, describes it as "a bird of the swamps," and prefers such as have open places of mud or peat, or even sand.

Apart from the noises already described as a part of the courtship performance, he never heard this bird utter any other call or alarm-note. Like the jack-snipe, it sits close when alarmed, allowing itself to be almost trodden upon before taking flight, when it rises with a whir of wings, like that of a grouse, but not so loud. It is a much easier bird to shoot, he tells us, than the common-snipe, flying much slower and straighter; while on the ground "it is a very comical-looking object; plump, short-legged, it shuffles about, half-walking, half-running: its bill always depressed, and, however intent it may be on feeding, it is ever on the watch for danger, and always tries to keep behind a bunch of rushes or a clump of sedge. It hides in the long coarse grass on the banks of rivers and lakes during the day, and comes out on the open in the evening—if there be any evening where it happens to live—to feed on worms and various small insects.

It is possible that this bird is not seldom passed over in mistake for large examples of the common-snipe, but it may always be distinguished therefrom by the white feathers in the tail, the more heavily barred flanks, and the presence of 16 tail feathers in place of 14.

The jack-snipe, which comes to us in October with the woodcock, differs but little in its habits from its larger relative, the "full"-snipe. It is quite as fond of marshes, and is, perhaps, remarks Seebohm, more often seen on the coast. It is at all times solitary, never associating in bands, or "wisps," after the fashion of the full-snipe. It sits quite as close as its larger relative when striving to avoid detection, but when finally flushed it rarely utters a note on rising. On the wing its

flight is slower and more bat-like, but it zig-zags quite as much as the "full"-snipe. Yarrell also comments on the reluctance of the jack-snipe to take wing when in danger. "It has been known," he remarks, "to allow itself to be picked up by hand before the nose of a pointer" rather than attempt to escape by flight. It seems to me that the jack-snipe will pick up a living during hard weather while its larger cousin starves, and this because of its ability to thrive on seeds. Be this as it may, the full-snipe, as we have already shown, *does* eat seeds, though this may be only a rare occurrence. Observations are needed on the point.

The question has more than once been raised as to whether the jack-snipe is entitled to rank as a genus by itself, on account of the fact that the sternum has two notches, while all the other snipe and woodcock have but one. It yet remains to be seen whether the jack *is* peculiar in this respect. Of many of the less familiar, more aberrant species, no records are extant as to the condition of the breast-bone. But, in any case, this is not so important a character as some with a limited knowledge of this aspect of ornithology suppose. The syrinx, as I have just ascertained by a series of dissections, differs conspicuously from that of any other snipe with which I am acquainted, or, for the matter of that, from that of any other Limicoline bird, and will possibly prove to be unique. It is formed by a number of fused tracheal rings of gradually increasing circumference, giving this end of the trachea trumpet-shape. Interposed between these fused elements and the first bronchial semi-ring is a free semi-ring, partly cartilaginous. Attached to its ventral end is a lingulate plate of cartilage the free end of which is attached to the ventral end of the first bronchial semi-ring. No other bird, so far as I know, displays such a peculiarity. But more on this head will be said in another place.

A word in conclusion as to the eggs of the jack and great-snipes. They are usually four, sometimes three, in number, pyriform in shape, and laid with converging points. The eggs of the jack-snipe are remarkably large for the size of the bird, and in this respect differ

little from those of the common-snipe. [Average size of 104 eggs, 1·5 × 1·08 in.; 38·2 × 27·4 mm.] On comparing a series of the eggs of the common and jack-snipes, it will be found that the markings on the eggs of the latter are, as a rule, smaller and more generally distributed, while both ground-colour and markings show generally more brown, the ground-colour being yellowish or brownish olive, and the irregular spots and streaks dark brown, with ashy underlying shell-marks. The eggs of the great-snipe vary somewhat in appearance, the ground-colour being generally stone colour or greyish buff, occasionally with a greenish tinge. The markings consist of bold blotches and spots of deep vandyke brown, rather sparsely distributed over the surface as a rule, but occasionally in profusion; the underlying blotches are ashy grey. [Average size of 31 eggs, 1·79 × 1·33 in.; 45·4 × 33·8 mm.].[1]

[1] F. C. R. Jourdain, *in litt.*

Jack-snipe missed by a merlin

By G. E. Lodge

VII

WILDFOWL SHOOTING

[Ducks. Geese. Swans.]

By Max Baker

1

Duck shooting as a branch of British sport with the gun received a severe blow when the Captive Birds Act passed into law. This measure was forced through the two Houses of Parliament in a burst of press-fomented indignation against the shooting of pigeons from traps, but its clauses were so worded as to debar the shooting of any species of bird when released from a state of captivity.

As all knew who were connected with the stage management of shooting, ducks can only be made to provide satisfactory conditions of sport by confining them beforehand in some species of enclosure, whence they are in due course released. That this must be so arises from the natural habits of the bird. It is a night feeder, making long journeys to and from the diverse and ever-changing places where provender is available, its day resort being some kind of sanctuary where hundreds forgather. Being powerful on the wing and of great staying power, it is up and away on the least sign of disturbance. In a word, its habits are the direct reverse of those of ordinary game species which use their legs for preference and only fly in the effort to escape some suddenly-appearing danger.

A small proportion of the duck population of a district may linger during daylight hours in reed beds or similar covert, but after being disturbed a time or two they join their brethren in one or other of the

resorts where experience has proved they are safe. At such places the material for sport exists in plenty, but the difficulty is to spread it out over a time sufficient for the loading of guns between shots. Where the catching-up system was practised on enlightened lines substantial contributions were received from the vast hordes of migrants which make their winter home in our islands, but under the conditions now enforced these mostly go scot-free, decoy ponds claiming a few, while others fall to the enterprising gunners who penetrate to their usually secure retreats or waylay them in the course of evening or morning flight.

Without embarking on any argument as to the degree of licence which is permissible in providing sport in a country now largely deprived of its wilder attributes, we may lay down generally that the quality of shooting required to kill ducks when flushed from artificial hides was at least equal to that of other game birds when dealt with each according to the methods in vogue. The sport they afforded was an incentive to rear them, the economic effect being a considerable production of human food, in turn derived from insects, herbage, and other natural resources otherwise going to waste. The hand-rearing of wild ducks is a highly economical process. Eggs are comparatively cheap, whilst on suitable ground large quantities can be collected from wild stock, this with positive benefit to the last-named because the second clutches arrive at a more favourable season having regard to supplies of insect food. The delicate and costly feed necessary for pheasants is not required by ducklings, they are not prone to disease, whilst in any ordinary year insect life is so abundant in the places they frequent that rations can early be economised.

Before and since the Act various devices have been proposed and used for making ducks amenable to what may be termed sporting conditions, and although the catching-up system proved always the most reliable, alternatives must now be used. That the demand for eggs has not been destroyed is a pleasing indication that natural methods of bringing them to the gun are meeting with success. In the first place, measures are being taken to purge the stock of that proportion of tame

blood which, while it made finer birds for the table, assisted the control that was exercised.

Stimulating the effort to retain the duck as a bird amenable to British conditions of sport makes part of the interest which we take in the tribe to which it belongs. To have them about the place and keep the larder supplied is, therefore, a widely diffused ambition. By studying their habits and making the available holding-places congenial much can be done to encourage their presence. The sport procured from them will be of the little-and-often kind, but this again fits in with the natural liking for rough shooting conditions, backed as it now is by the reversion to that state of many formerly well-preserved domains.

In consonance with the conditions imposed, my plan of writing will be to list the several forms of wildfowling sport with which I have come into contact, leaving the reader to apply so much of it as appeals to his own circumstances and leanings.

That England is gaining rather than losing its attractions for web-footed birds is a fact which at first seems in contradiction to the spread of population. When the fens were drained, and other large tracts of duck and goose land were brought under cultivation, the resorts natural to these birds suffered a considerable diminution; but, granting that set-back, conditions have since greatly mended.

In the first place, the widespread love of Nature has resulted in the better protection of our more important rivers from the attentions of promiscuous gunners. Sheets of ornamental water have been installed in public parks and on private residential estates. The preservation of game, and even the letting of shooting rights without preservation, lead automatically to the protection from incessant disturbance of rivers, swamps, and other places where wildfowl naturally resort. The acquisition of full sporting rights by fishing clubs has likewise increased the number of sanctuaries. And even if shooting is occasionally indulged in in some of these places, it is in a regulated manner quite distinct from the methods which would prevail were local gunners free to indulge. Then we have the spacious sheets of water in the form of

reservoirs which modern engineering enterprise has provided in response to the demands of population.

Even the decline of farming has contributed many fresh water-logged areas, lack of means having enforced the neglect of surface drainage, with the result that vast areas in the aggregate are nowadays swampy or periodically flooded, which under better conditions, or with wiser administration, would be dry meadow. Likewise the cessation of arable farming over quantities of land below tidal level has in turn led to the neglect of sea-walls and the consequent reversion of much of this land to the condition of saltings. Correspondingly, the newer estuary deposits which former generations would have reclaimed provide ever-increasing spaces where fowl are comparatively safe and find abundance of food.

And we must not disregard the smaller contributions such as result from abandoned excavations, whence clay, gravel, and other surface minerals have been gotten. For there is no piece of water which is neglected by ducks during the whole span of the twenty-four hours. A case has even been known where the watered cricket pitch in an urban district revealed the unmistakable traces of nightly visits from ducks in pursuit of the worms which were thereby tempted to the surface. Thus our inland area of water or water-logged land is ever spreading, providing sites innumerable either for breeding or for the reception of migrants which resort to our country for the sake of its open winter climate. Why these facts are so little appreciated is that the visiting time begins with darkness, up to which moment the ducks are sleek members of a park pond community, or else are hidden in some distant sanctuary, maybe thirty or forty miles away.

Nothing is more weird or eerie than to remain hidden beside one of these daytime sanctuaries and, as dusk merges into blackness, to watch the scattering to all points of the compass of the flocks and parties into which the apparently somnolently-inclined gathering has divided. Departure affords the impression of a sudden impulse, no doubt being regulated by the necessity for caution while humans are

about, but the early morning return is more prolonged, since there are fewer people about to hurry the feast to its close.

The home production of duck species would be considerably greater than it is at present but for the fact that those useless creatures, the coot and the moorhen, occupy every available breeding site in the country. Whilst the one gains its nourishment by diving, the other scours the surface, so that between them they leave little for more desirable species. Instinct has taught both that rations would be scanty if any quantity of wild ducks were allowed to rear broods on the waters they regard as their own. Hence they smash up, while not eating, any clutches of wild duck eggs which are laid in their vicinity.

If incessant war were waged against coots and moorhens, British ducks would materially increase. Both are comparatively vulnerable in times of hard frost when ice seals their natural refuge. Their nests should be sought after and mercilessly robbed—that is, if the choicer and more delectable residents are desired. No doubt they have a system of allocating amongst themselves the available quarters, hence the creation of a vacuum in any one spot would encourage migrants; but as the same character of fight is waged against other vermin species in the interests of game, and is successful, the principle might be applied to ducks. Pike offer another difficulty; but where serious operations are afoot their presence can be avoided by the utilisation of ponds of the flooded-meadow type, as will be mentioned in due order.

2

The problem of how best to utilise local opportunities for duck shooting varies with the conditions presented; but this much applies to all cases, that if they are treated without method or discrimination results are bound to be sadly disappointing. The party of guns which has been assembled for partridge shooting, and, as an extra item, surrounds the pond or lake where perhaps hundreds are congregated, may fondly hope for sport in proportion to the apparent opportunity.

More often than not the birds on being disturbed will get up in a single flock, and although their departure may be marked by an active but short-lived bombardment, few remain behind as a testimonial to the skill exercised.

Where pools exist in chains, or even where only two are available, much better results are obtained by stationing the guns some distance away from the actual water and, so far as possible, in the natural line of flight from one sheet to the other. Flushing may then proceed more gradually, whilst those which alight on the neighbouring pond may be left to accumulate till wanted. Thus the drive can be prolonged until such time as the birds have been driven away for the time being.

Feeding can be so arranged as to locate the stock in certain places at certain times, all with due regard to the placing of the guns. A good deal also depends on getting a satisfactory strain to suit the conditions, sufficient wildness to promote ready flight, but not such marked strength on the wing as to result in near refuge places being disdained.

By due development of the processes indicated daylight shooting of the home-reared population of wild ducks can be brought to a high state of organisation. So far as possible the main sanctuary should be protected from undue disturbance, shooting in its near vicinity to be only rarely indulged. When the catching-up system was practised it remained inviolate, hence the newer methods which are imposed should, as far as may be, continue the same principle.

In places where daylight, or rather middle-day, shooting is not a necessity several splendid sporting occasions may be provided by locating butts around pool or lake margins and placing the guns therein during the chilly hour which precedes the first glimmer of daylight. Supposing this to be 4 a.m. on an August morning, sport may be enjoyed right along till breakfast time, when the latest of stragglers will have come home from their night wanderings. The morning is spent gathering the slain and dealing with any skulkers which, notwithstanding the inhospitable reception, have elected to remain in the accustomed spot, the afternoon being rightly dedicated to forty winks. Although this treatment of an erstwhile sanctuary is a trifle drastic, it in

many cases affords the sole means of levying toll on a favoured mere or pool.

Should tidal water adjoin the scene of sport a number of unofficial guests will swell the party; similarly, owners of neighbouring water will avail themselves of the "stir" which has been created in the duck world. However, this is all in the day's work and a recognised sharing of its good deeds. The procedure may be repeated about twice, the bag showing big proportional reductions each time. The duck tribe is legally classified *ferœ naturœ*, which, broadly translated, means, "it knows how to take care of itself."

The classical example of highly organised duck preservation is that exemplified at Netherby, where Sir Richard Graham, in pursuit of a hobby, constructed a large number of ponds on a low-lying and agriculturally useless stretch of land forming part of his estate in Cumberland. Duck shooting on the Netherby system is a well-known phrase, yet nobody at Netherby seems to know what it is.

What really happened is interesting to relate. Sir Richard, wanting a duck pond, dammed up a stream. "And behold it was good." Not perfect, however, for it silted up, and pike could not be denied access. He then bethought him of another idea, which was to embank an adjoining field and flood it by temporarily damming an adjacent rivulet. Thus he not only obtained a large expanse of pool of the ideal depth for surface-feeding ducks—that is, a maximum of 18 inches—but its gradual drying up in summer time opened up a constant succession of fresh feeding ground, congenial to snipe and other species.

Thus began so entrancing a study that before many years had elapsed there were twenty ponds, each enclosed, together with an equal quantum of dry land, by fox-proof fencing, to ensure perfect quietude. Apart from home-bred stock, ducks came in by hundreds from outside, the sanctuary conditions serving as a sufficient draw, apart even from the maize that would be plentifully scattered on the water. Teal especially favour these ponds, for although they go away to nest in the surrounding country, as soon as the young brood can fly they are guided by their parents to the ponds, which they thus learn to regard as home. To recoup the cost

of this endeavour large quantities of mallard are caught in a special form of tunnel trap and despatched to market.

Whether Sir Richard's enterprise is mainly inspired by the shooting or the nature-study motive is hard to say. That his ponds serve both purposes equally well is undoubtedly true, and where ordinary people are lucky if they have mallard available for shooting Sir Richard can show teal as well. The only misfortune is that he has not recorded in writing his amazing experiences as a self-taught encourager of wildfowl life.

What he has done apparently any one can repeat, as I myself have proved in two separate instances. The fundamental rules are simple and easily grasped, and the reward is shooting of a *recherché* kind. The system could be effectively tried with a single pond, but in laying it down regard should be paid to the possibility of later installing another a nice flight distance away.

There is possibly no estate where water occurs on which butts could not with advantage be placed in positions to command the observed lines of flight of ducks when passing from some place of daylight retreat to their night feeding grounds. Knowledge of their movements can be obtained by twilight rambles at the time when they are usually on the move. Such structures may be formed amidst the rushes bordering the stream-side—better still, perhaps, near clumps of willow and such-like growths, which may be trimmed so as to combine the necessary clear view with a snug place of shelter.

In dry districts where a single dew pond may be the resort during the night of many parties of ducks which are mainly occupied in feeding on the stubbles roundabouts the same methods may be adopted, subject to the difference that an all-night vigil might be well rewarded around the time of full moon.

No single butt is quite as good as the choice of several, since the fowl get shy if unduly harried at one particular spot. Experience alone, which is best gained during the hours of patient watching, will reveal the best places and times of attendance. In certain situations a covered approach to the ambush, or it might only be a coign of vantage, would supply chances otherwise unobtainable.

Though middle age must be very keen before it will avail itself of these pleasures, young manhood glories in the spirit of adventure which is introduced, and as the best sport is usually to be obtained on the very opening of the duck-shooting season the scheme fits well into the summer holiday period when incidental amusements are at a premium.

3

No discussion of inland wildfowling would be complete without a reference to the Norfolk Broads, not because the area so defined possesses any great importance in the sense indicated, but because people think it does. I have visited the Broads—that is to say, have slept, eaten, and otherwise lived the whole twenty-four hours on the bosom of their waters for whole weeks at a time in every month from May to October; and, although having closely studied the bird life thereon, have never been struck by the particular appeal it is supposed to make.

I have seen Loch Leven dotted all over its enormous area with various sorts of fowl, bobbing up and down on the wavelets like so many boats at anchor, and was told that ten times the number had been present before the first hard weather drove them farther south. On a private East Coast pond, formerly used as a decoy, I have watched from daybreak onwards the incoming parties, afterwards putting them on wing to assure myself that the estimated total of a thousand was no exaggeration. I have visited and comprehensively studied Captain Prettyman's decoy pond at Orwell, near Ipswich, an equally small and equally well guarded piece of water where the season's catch runs into five figures. An Essex shoot which I hired one year included a fleet about a mile long, which throughout the season imparted the impression of being greatly more favoured by ducks of all sorts than anywhere on the Norfolk Broads.

Their great space doubtless does poor justice to the stock that undoubtedly is there, but that the population is sparse having regard to dimensions nobody can well deny. True, there are the bittern, the great

crested grebe, and many other choice species, but no approach to such sanctuary conditions as can better be gained on a small space of water than on wide expanses, where of necessity coot and moorhen are mostly in evidence. Through August and September each farm bordering the dykes, fleets, and rivers seems to own its gunner, who takes up his station and fires whenever opportunity arises. Such widespread popping offers opportunities for unauthorised firing from the craft which enjoy the right of penetrating practically everywhere, and although this is not much done the practice is furtively carried on. During the nesting season touring yachts besprinkle the entire navigable area, and that the air-gun is frequently taken aboard is indubitably proved by the hasty retreat of any moorhen which is surprised by the stealthy approach of one of these vessels. Taking the Broads all over, there is, as already stated, a goodly total of ducks ; one sees them about and witnesses their rise when disturbed by some prowling gunmen. Nevertheless, and notwithstanding, the place is a disappointment.

Around Hickling Broad and Horsey Mere better protection is afforded, but as it is carried out in the interests of shooting the assumed Paradise nowhere exists. The breeding season is to some extent an exception, but the possible yield of these waters is hampered by the vast array of coots. Some nice evening flight-shooting is obtained at pochard during the early winter, and, of course, other sorts are to be had in moderate quantity ; but having regard to the known habits of ducks, I should seek the migrant winter population in smaller and more isolated spaces of water and on the foreshores, whose wide spaces ensure a disturbed sort of privacy.

The ideal spot for the day entertainment of ducks would be a pond of but a few acres in extent, completely surrounded with trees, reed fencing, or bushes, secured by wire surrounds against human and animal intrusion. It would be plentifully provided with sunny banks and islands, where the birds can rest after their night wanderings. (Teal, by the way, favour plank benches set up in the middle of a pond some inches clear of the water.)

One may ask what might be the shooting value of such an asset, the

reply being that to encourage the presence of ducks is the first consideration; and further, that such a place judiciously used would still be acceptable to wildfowl, that many lines of flight radiate therefrom, and that these could be used at a safe distance from the central resort.

4

Having systematically considered inland conditions of wildfowl shooting we come naturally to the free sporting which is obtainable around the coast, more especially in the neighbourhood of river estuaries. That this branch of shooting possesses a fascination and romance entirely its own is undoubtedly true, though we must recognise that many of the most eloquent tributes are from those who can speak only from limited experience or second-hand knowledge. A certain proportion of wildfowlers are so from choice, but the majority are those who by their position in life are denied the indulgence in more costly forms of what, after all, is a universal instinct.

By the law of the land the public enjoys free shooting rights over that indefinite area known as foreshore, this because all property in such is vested in the Crown, and the Crown, not being selfish, allows the multitude to sport thereon. Exceptions occur where grants have been made to private individuals or corporate bodies; but these are well known locally, the rights having in some instances been established in a court of law.

Generally speaking, therefore, the public not only enjoys a right-of-way over the foreshore, but can avail itself of the sporting opportunities to be enjoyed thereon. It can proceed to the chosen spot by boat or land, provided in the latter case it does not trespass in so doing. Foreshore is approximately the surface which is alternately covered and left bare by the tide, the area so defined being rendered indefinite by the variable height attained. The same quality of right exists in regard to shooting from a boat on a tideway, so in total there are so many things a wildfowler may do that he generally ends by doing a few more.

True, the irate landowner or his representative could make things unpleasant for the gunner who adopts an excessively wide interpretation of his rights, but as the culprit can usually retire promptly to the safe haven of indisputable foreshore he is seldom molested. Should he, however, kill game species while trespassing he becomes a poacher pure and simple, and can be dealt with accordingly.

Bearing in mind the difficulty of guarding a territory intersected by public ways and shooting rights, wildfowlers have been conceded a liberty in excess of strict legal rights. As a rule they keep strictly to the salt-water side of sea walls, whilst regarding everything outside these very definite boundaries as their legitimate sporting ground. Strictly speaking, they have no rights whatsoever, the case being one of undisturbed use.

Shore shooting must of necessity be mainly limited to the local gunner whose enthusiasm for sport finds no better opportunity. He does not dress for dinner, nor even partake of the meal so described in other spheres. Between tea and supper, then, is for him a long spell of hours which can be pleasantly filled by waiting under the shelter of the sea wall on the chance of a duck, perhaps a curlew, a plover, or one of the other shore birds which are worth powder and shot.

The owner of a dry-land shoot having an estuary frontier is usually too fully occupied to find time for the rather meagre chances which present themselves as the reward for long waiting at unseasonable hours. Exceptions undoubtedly occur, but they are mostly limited to those for whom mere presence in these wild and secluded places is sufficient reward. Shots are obtainable from time to time, especially at certain stages of the tide, but the best work can only be done during the hours ordinarily devoted to social intercourse or slumber.

Accepting this handicap, the sporting, and more especially the natural history, enthusiast who lives near estuary water can hardly fail to be fascinated by the innumerable species of shore-haunting birds. If leisure is available he will go out on sundry lonely expeditions, and occasionally, perhaps, fire a shot rather by way of giving meaning to the outing than because serious results are possible.

Should the fascination gain hold, keen observation soon suggests places where worthy sport might be obtained, and so begins the never-ending contest between human intelligence and the high order of instinctive gifts on the other side. Though bags are chronically small, the great charm is that one never knows when luck may come along. On all sides considerable flocks from time to time show themselves—widgeon in their hundreds; the common wild duck or mallard in parties ranging from half a dozen to twenty; teal in about equal quantities; geese sometimes; with occasionally in the season an immense concourse of golden-plover.

At times there is the delight of being so well hidden, and remaining so perfectly still during the period of approach, that the wary curlew comes within shot, perhaps a party of them affording a right-and-left. That England's free shooting is better than its free fishing, for instance, is a certain fact; but it is, and always will be, strictly preserved for the few who glory in what most people would consider ill-rewarded hardship.

Clearly, if one must be in remote places at peculiar hours, a yacht is the one piece of machinery which will solve transport and sleeping problems combined. By its aid only can the gentleman wildfowler do adequate justice to the sport of which he has made himself master. He has studied a particular range of coast, knows its estuaries, creeks, and mud flats by heart. The yacht is kept in commission throughout the winter, being probably of the wherry type so as to pass easily into the shallowest water and there lie in comfort during low tide.

Even then the programme enforced needs high courage to face. Long spells of inaction, and all in the cause of those brief moments when everything is right for the streaming flight of otherwise unapproachable birds. The favourite mooring-places are visited in turn, and one by one the choice coigns of vantage occupied, these having been discovered in the course of long experience. Particular rills at particular tidal times are known to yield their almost certain harvest, the programme of the visit being carefully planned so that each will be visited at the proved right time. Complete as the knowledge gained

may appear, there never passes a day but what something fresh is learnt: it may not be wisdom of the gods, but it contents the wildfowler.

Such winter cruising is only for the most hardy of constitutions—that possessed, for instance, by the man one sees repairing the roof during a spell of bitter weather. Its acutest rigours bring compensation in the sense of having risen superior to discomforts which would kill other people—the harder the weather the better the sport being the guiding principle throughout.

Another type of yachting-cum-wildfowling enthusiast is he who dislikes night-time wanderings and elects instead to stalk on the open seaboard the birds which during a middle-day tide are resting on the water patiently awaiting the hour when their feeding grounds will again be uncovered. Whether the vessel be sailing craft or launch, procedure is the same—that is, having marked a party on the water, to set such a course as to seem to the watchful eyes no more than a passer-by, to reach as close as vigilant suspicion will allow, and finally to drive right at them so as to shorten, if only by a few yards, the separating space. The 2-inch gun booms across the water—perhaps there are two of them, one for firing while the birds are still on the water, the other just as they rise; cripple guns are in readiness to deal with the strong swimmers: so, all told, the sport is full of excitement.

This method is highly effective against brent-geese, especially in the early part of their season. At that time the family parties seem still to remain together, perhaps drawn extra close by some drifting tangle of goose grass upon which they are feeding. Some say that they actually detach these masses in order to prolong the meal during the time when their peculiarly slushy feeding grounds are under water.

When the craft available for this work is a launch it can be used for cruising in the backwaters, rare but choice shots from the big gun being possible—as, for instance, when the engine is cut off and the vessel proceeds by her own momentum, assisted by the tide, round bends in the creeks—shoulder guns being always kept ready for birds suddenly appearing over the sky-line.

If a man knows a good place and it is accessible from the shore, there is no distinction in principle between occupying it without the aid of a yacht and making use of that more convenient and versatile method. Perhaps he can reserve quarters near by, a few hours' rest on arrival preparing him for the early-morn departure—that is, before the sun has commenced to lighten the sky.

Whatever the means of reaching the desired haven, the most accomplished among wildfowlers are invariably on the spot so as to utilise the favourable hour when night merges into very early morning. The waiting gunner thus gets his chance of as pretty a piece of "driving" as can be attained with the help of beaters, but he must be the superfine type of marksman who can take aim at the vaguely-seen flutter of wings and gain early notice of their approach by keen sense of hearing.

In August, when the season opens and the spring hatching of young birds has still to learn the ways of the world, notable bags are obtainable. That there is no secret about the method is testified by the thousands who witness sunrise at that time of year. Other opportunities arise when migrants coming from unsophisticated places put in their appearance, but, generally speaking, August and September are the best months, a second season being vouchsafed should a hard spell occur after Christmas. This is when the wilder and more important birds are to be had—the various sorts of geese and swans, with always mallard, teal, and widgeon as the principal ingredients of the bag. If the limit of edible species is laid down, brent-geese must often be let go by, for latterly the taste among locals for their highly-flavoured flesh seems to have departed.

The faculty of shooting at night can be cultivated inland during the later stages of the winter—that is, when the stubbles have been gleaned or have been buried by the plough; when acorns and beech mast are all gone and ducks are perforce driven to the stream margins. If heavy floods have been prevalent they will be too much scattered; but, barring that mishap, there is profit as well as entertainment in taking an evening promenade by the river. Even the ducks which

preen their feathers undisturbed on the Serpentine fly off at night to their true feeding grounds—the streams and sewage farms on the north-west borders of the Metropolis.

For any one who is willing to take trouble there is no more pleasant form of sport with wildfowl than to shoot them over decoys. Suitable representations can be purchased from gunmakers, whilst ingenuity can contrive nearly as useful specimens, in the form of a raft, of duck form at the water-line, with hinged profile above. Whatever style is adopted, procedure consists in anchoring them in the chosen pool and fashioning an ambush within gun range. Tidal water is unsuitable for the purpose, since the drift and changing level necessitate constant adjustment. More suitable, and also more conspicuous from the point of view of birds passing within sight, are those small pools which are left by the tide or are formed at the level of the saltings by the removal of mud for repairing sea walls. Fresh water or even brackish ponds inside the sea wall are equally suitable so long as observation has proved their attractiveness either for feeding or ablutions. The ambush should not, if possible, betray its purpose to fellow humans, since its casual occupation by others would cause undesirable disturbance. Provided bushes are near, a simple hole for the legs suffices, a pad being brought along by way of seat. This may be a simple board, though better still is a properly made cushion consisting of a flat canvas bag stuffed with cork dust, painted and provided with a rope handle. The sailmaker who supplies yacht fenders will make what is needed for a few shillings. If the chosen hide is at the bottom of a rill, a board or other slab should be sunk in the chosen spot so as to afford easy and untenacious foothold.

No catalogue of wildfowling types would be complete without naming the professional of facile conversation who takes "gents" out shooting and prods them violently in the back lest they should fail to notice the approach of a conspicuously visible redshank or even a dunlin. What is lacking in the shooting part of the entertainment they provide is more than made up by their stimulating conversation. Many such men are genuine wildfowlers, this quite apart from the

showman aspects of the profession which they have taken up in order to procure a living. Hence, if they are judiciously cultivated, they will in time consent to reveal some of the wisdom which is ordinarily kept in reserve. A good deal depends on the estimate they form of their patron, his quality as a shot, his willingness to suffer hardship, and his contentedness with sparse results when nothing better can be attained. Mere readiness to weigh out money is apt to stimulate less desirable traits to the exclusion of what is really desired.

The true professional wildfowler is a different type altogether, self-contained and often taciturn, in sympathy with the lonely life he leads. Perhaps the reason is partly because the amateur enthusiast persistently disturbs his ground without even the justification of securing results, his reckless exposure and shooting at impossible distances handicapping the professional's more deadly methods.

They are a sadly diminishing class; in fact, have well-nigh disappeared in most places. In times not so long ago, certainly within the span of living memory, each portion of our coast-line which is furnished with estuary formation possessed its band of professional fowlers. Their descendants may still be seen as dots on the mud expanse industriously gathering winkles during the brief period between tides. Theirs was always a hard life—some sea craft, a little fishing, odd labour work at the fishing ports, not much pleasure boating because they are hardly presentable enough, they picked up, and still pick up, a living as best they can. The soft spot in their character is devotion to their beloved foreshore.

Those still remaining use the same gun as their father and grandfather before them, the heirloom being of the familiar type with long barrel, 1¼-inch bore, and receiving its ½ lb. of shot *via* the muzzle. Mounted amidships on a tiny punt it commands a range of about 60 yards, the essence of its use consisting in firing into the brown. The cost of each round is a sufficient consideration to ensure careful striving and a close estimate of possible results to ensure a balance of profit on the transaction.

So numerous were these craft at one time that as many as twenty

would approach a concourse of geese, the chosen leader giving the signal when all should fire, the aggregate result being equally divided. The few remaining members of the profession usually own a small-size fishing smack, whereby their radius is extended so as to glean over a wide space the now much reduced supply of birds.

Why birds should be less than formerly is not clear. Perhaps at their distant breeding quarters egg-taking is more persistently carried out; perhaps, again, the inland sanctuaries are more numerous and quieter. Certain it is that spells of frost drive considerable flocks to the foreshores, which for a time are reminiscent of their old aspect. In certain places the mud flats are taking on a harder, and therefore less favourable, consistency, though presumably there should be compensation in the newer deposits.

When the amateur takes on punt gunning it is usually with a double-handed craft, so that he may be accompanied by an attendant who acts in the office of skipper. A heavier gun follows as a matter of course, and being a breech-loader it saves the difficult task of reloading from the insecure foothold of a mud spit. The largest bore runs to 2-inch calibre, the shot charge being thereby increased to 2 lbs. With such a gun shots can be taken up to a range of 100 yards, greater distances, though frequently claimed, being undesirable.

Whilst sporting sentiment is against the methods of necessity pursued when out with these guns, the justification put forward is that by no other procedure could success be attained, and this against food species which would not otherwise contribute anything to supplies. In Holland swivel guns, as they are called, are barred; but over there wildfowling is a recognised sport and brings valuable grist to the mill, not only in the matter of food supply but in the money spent by wealthy amateurs in pursuit of sport. The finance of the situation can be stated in a few words. A wildfowler secures the bare higgler's price for whatever he shoots—little more, say, than an odd shilling or so for a mallard, less for teal and widgeon, and so on. The sporting value of shooting the same birds is nearer ten shillings apiece, this sum being expended in services and the upkeep of boats.

No matter what may be the particular draw that takes a man out wildfowling, there can be no doubt as to the stimulation of soul which adventures in the no-man's-land of the foreshore bring to the mind stressed by the rack and effort of modern life. The surroundings convey a weird impression of a long-ago era when the earth had neither form nor substance. Listlessly as the tide ebbs and flows, there is a relentlessness in its purpose which appeals to the imagination; whilst tingeing all such experiences are the musical, yet always sad, cries of the birds which haunt these places. Living amidst the most loathsome filth, they remain spotlessly clean, so suggesting a metaphor of universal application. The nature lover is seized with the thought that the birds he sees must of necessity be great travellers, some Arctic coast being the summer resort of many of their number. The lesser birds which furnish the landscape are equally cherished, for although not a sporting asset they form the subject-matter of endless observation. Civilisation is at the best an endurable convenience. To get away from it, even for a brief while, is joy untold, and we have the opportunity at our very doors.

5

Though geese are the ambition of all wildfowlers, the opportunities to add this wily creature to the bag are extremely rare or else local. Being a bird of day-feeding habit, it has reduced to a science the conditions for ensuring safety. The inland feeding grounds it commonly frequents are always of an open nature, providing few opportunities for stalking or lying in wait beforehand. By such dodges alone can they be circumvented, save on the occasions when wild and blusterous weather enforces a lower altitude of flight to and from the feeding grounds than is ordinarily observed. When not feeding they betake themselves to the open sea or perhaps to some outlying spit of sand, where, as always, the posted sentinels give early warning of any suspicious approach. In districts where these birds abound, local gunners devote themselves to

their pursuit, cheerfully accepting the disappointments and hardships imposed.

Probably the best-known spot where goose shooting is regularly obtainable is on the foreshore abutting on Lord Leicester's estate at Holkham, on the north coast of Norfolk. Gunners from all parts of the country, the Midlands especially, converge on this resort, Wells-near-the-Sea being their headquarters. Hearsay would lead most people to believe that a permit must be obtained beforehand from the Holkham estate office in order to enjoy the opportunities presented; but this is hardly true, since the permit applies only to a stretch of saltings some distance away from the goose ground, where only the ordinary kind of wildfowling is obtainable. In the year 1923 about a hundred such seasonal permits were issued, and as the space extends to little more than 1,500 acres, it no doubt pays the price of its excessive popularity.

The situation with regard to geese at Holkham may be briefly explained. Some seventy or more years ago, the second Earl of Leicester reclaimed a considerable area of salt marshes which were bounded on the seaward side by a long stretch of almost mountainous sand-hills. To protect from wind-borne sand the choice grazing land which resulted, he planted the hills with conifers, these in their mature state now forming a belt exceeding a mile in length. Geese enjoy inviolable sanctuary on these reclaimed fresh-water marshes, neither his lordship nor any friend or member of the family breaking the rule of quietude here imposed. Since the geese feed here by day and fly out to sea by night, they of necessity pass over the tree belt, also the foreshore beyond, in making their morning and evening journeys. The locals and visitors await them on the foreshore; and although forbidden from taking their stand on the sand-hills, the presence of spent cartridge cases thereon proves that the efforts of a vigilant keeper are not always effective. That the geese elevate their flight when passing over the belt proves their ability to take appropriate precautions; hence many gunners prefer to dig themselves in well out on the sands, so getting their chance while these great birds are flying comparatively low.

The best reputed individual bag for the 1923–24 season is quoted

at seventy head, with several around forty next in order, their compilers being local residents. Opportunities for shots within range of the heavy guns usually employed in this work are restricted for the most part to certain conditions of weather wherein the birds are buffeted in their flight, or, for visibility reasons, are compelled to fly low. When such conditions prevail, or are indicated as likely, the professionals on the spot advise their patrons by telegram that the time is auspicious. There are many disappointments, but also a fine spirit of hopefulness, which occasionally gains its reward.

Of quite a different habit from the inland-feeding geese is the brent- or black-goose, which confines itself more particularly to salt water and the broad expanses of ooze where grows its favourite "grass." No reference to wildfowling would be complete without giving this plant its botanical name *Zostera marina,* hence I obey the convention. These feeding grounds are an amazing conglomeration of treacherous sludge where quantities of water are held up, forming aquarium effects, the long streams of goose grass conveying an enchanting impression in surroundings which savour only of drab dreariness. Between these feeding grounds and the open sea, where rest is taken at high tides, these birds seldom venture, though in crossing from one place to another they often offer chances to the well-hidden wildfowler. For the punt gunner is reserved the best sport they yield, whilst, as mentioned elsewhere, chances for the swivel gun when mounted on the deck of a yacht are available on the open water. Though there are few who would let the rare chances this bird affords go by, those who can see their way to carrying home a full load of the choicer duck species are in the habit of leaving them alone.

Wild swan shooting, although included in the term wildfowling, can hardly be recognised as a legitimate food-procuring sport. In view of their comparative rarity and our pride as a nation in showing them hospitality, none but the naturalist-sportsman would be justified in procuring specimens. Of no recognised food value, they rank solely as beautiful denizens of our wild places, always recalling the proud place they held in the feasts of our progenitors.

6

As to the guns needed for wildfowling, fancy, especially on the part of the novice, usually dictates something of the blunderbuss order, as unhandy in weight as dimensions. To the study of this question, including its department of ballistics, I have naturally devoted a considerable amount of time, and at the finish remain faithful to the ordinary style of game gun having the right barrel true cylinder, the left perhaps full choke. This view was early formed by meeting a wildfowler of supreme understanding, now alas! dead, who used only the simple type of gun, actually without choke in either barrel. This he used for all his work, and he was out most days, the punt gun being his next larger weapon. His view was that if you are properly hidden the birds are as likely to be too near as just out of range, and, therefore, that the gun is best which handles easily and delivers its charge with maximum spread.

The novice shooter—especially of the kind that is suddenly fired with enthusiasm by reading some more or less imaginative article on wildfowling—is unable to realise that birds can see him just as well as he can see them. Consequently, he walks the shore in broad daylight, usually choosing the most conspicuous places because better foothold is there to be obtained, only crouching when birds are on wing. Just as our soldiers were notorious during the South African campaign for showing themselves on the sky-line, so the novice wildfowler seeks publicity on the sea wall. What wonder, therefore, that everything is just out of range, and that he conjures up visions of something sufficiently powerful to remedy the mistakes he is unconscious of making?

Even when a true fowler is properly hidden he is compelled to allow many chances to go by. He can only be in one place at a time, even if that place proves to be the wrong one by only a few yards, but that is all the more reason for not unnecessarily alarming the birds, which may fly closer on a later occasion. Likewise, and finally, the gun chosen for any class of work must be a compromise, and the compromise is best which discourages shots at extreme range.

Perhaps the problem of range can be most clearly expressed by reviewing the several shot charges available. The human frame being what it is, the gun which it is able to wield with greatest success weighs from 6½ lbs. to 6¾ lbs., and the charge the gun delivers is usually 1$\frac{1}{16}$ oz. If its boring is of the cylinder order, this best suiting English game-shooting conditions, its zone of maximum efficiency extends from, say, 25 yards to 35 yards—which is to say, that the charge has thereabouts spread so as to cover the widest space it can amply furnish with pellets. At shorter ranges there is less spread, and, within it, a corresponding super-abundance of pellets. The full-choke left barrel, which is here suggested for wildfowling, achieves similar results at about 10 yards greater range; but in its case the handicap of deficient spread at lesser ranges is relatively much more pronounced. In game shooting any high degree of choke is unnecessary, because when a bird crosses at a distance to require its aid such a bird is the property of a neighbouring gun, and you must leave it alone. In wildfowling there is seldom a companion gun to consider, hence there must frequently arise occasions when maximum ranging power is desirable.

The next stage above the game gun is the pigeon gun. Its cartridges carry 1¼ oz. of shot, say one-sixth extra, but the gun has to be correspondingly heavier, and it is astonishing what a difference the additional pound makes by way of reducing handiness and slowing the swing. After the pigeon gun we have the true wildfowling gun, which, still in 12-calibre, has chambers 3 inches long and handles 1½ oz. of shot. It weighs upwards of 8 lbs. and usually feels more. Next comes the 8-bore with its 2-oz. load, and finally the 4-bore, whose charge approaches 4 oz., and must weigh around 16 lbs.

Now it is very doubtful whether any of this large-size artillery has an effective range materially exceeding that of the ordinary shoulder gun of game weight. Punt gun performances at 60 or more yards, using as a minimum a ½ lb. of shot, offer no criterion, for this style of weapon is fired at dense clusters of bird—not flying.

What limits the ranging power of the shoulder gun when directed at distant flying objects is, first, the virtual impossibility of knowing

where the bird will be by the time the charge has traversed the intervening space, and, second, the extreme scattering of the charge beyond 40 yards.

Let us deal with the two conditions separately. The shot charge occupies approximately the seventh part of a second in covering a range of 40 yards, and a quarter second over 60 yards. In the former space of time a bird moving at 40 miles per hour will have traversed a distance of 9 feet, and in the other 15 feet. An experienced shot can aim ten (or perhaps a dozen) feet in front with very fair accuracy, whilst making due allowance for deviation from the assumed speed of flight; but when the needful lead is materially increased beyond what may be treated as the 10-foot limit, the chances of error become overwhelming. The bird itself is also accorded the opportunity to diverge from its former line of flight, for it can hardly fail to notice the movement of the shooter. Game birds are usually faithful to their selected line of flight, but wildfowl are adepts at the climb and swerve.

The other item of difficulty is that no matter how good a pattern a gun may deliver at 40 yards, the pellets separate in an amazing way after that critical range has been passed. Thus, whilst the intended quarry may receive a half-dozen of pellets at 40 yards, the number falls to nearer a couple at the far distance. At what intermediate distance between 40 yards and 60 yards a close-shooting and heavily charged gun can do effective work is hard to say, partly because the result depends so much on the shooter, and, again, because range can only be approximately estimated. Judging from target results 50 yards would be a very long shot, the much more distant kills which are claimed being either the lucky result out of many failures or romance pure and simple.

That many wildfowlers do favour powerful guns is a fact to which all due respect must be paid. In all probability the choice is dictated by conditions where, over and over again, long shots or none at all are imposed, palpable hits often failing to effect the intended purpose. The harder hitting gun then comes into its own, and there is much to say on its behalf from this point of view. Taking the game gun charge at the round figure of 1 oz., and assuming it to be composed of 300 pellets of

No. 6½ size, we can see at once that a charge increase to 1½ oz. will permit the component projectiles to be 50 per cent. heavier for the same total number. Size No. 4½, running 200 to the ounce, is thus made possible without change of pellet total. Its striking effect is considerably greater, and a charge so composed maintains, at the longer ranges, what an airman would call better formation.

Should one of the bigger guns be adopted, the duty is to employ it so consistently that the skill attained in its manipulation, together with the experience gained as to its power, is on a par with the ability which has been reached in using an ordinary gun. After the easy and supple motions of the last-named, the heavy wildfowling cannon seems dead and inert by comparison, so showing that the two do not readily interchange, and that one or the other should be definitely adopted. To take out a big gun once in a way is to fall under the temptation of attempting the impossible, unbacked by that skill in use which custom alone brings into being. Not only are the birds badly scared, but the shooter is apt to forget that guns will wound at ranges far beyond their effective killing distance. If a sportsman mixes the pursuit of game with wildfowling he would certainly be well advised to use either his ordinary gun, or, better still, a commoner quality weapon having an extra special close-shooting left barrel. In view of the heavy clothing worn on such excursions the stock might with advantage be on the short side. Incidentally, I would suggest that a wildfowling gun should be non-ejector, the reason being that fired cases when pitched out into the water are carried incredible distances by the tide, and ultimately collect in conspicuous places, where they impart a maybe false suggestion of the sport obtainable. Far better collect them in a bag, and afterwards bury them deep in the mud.

As to the choice of loads thousands of essays have been written, and yet at the finish no new fact has emerged, and no extreme recommendation been widely adopted. Obviously, if any advance on the standard game charge of the day were possible, it would be universally adopted —therefore the ordinary charge of the moment is the best of its kind. The assumption, for instance, that No. 4 shot should be used on ducks

legislates quite plausibly for their supposed greater toughness as compared with game, but it overlooks the serious resulting loss of what are called "hitting pellets." Much capital is made of their impenetrable breast feathers and pectoral muscles, but the reply must always be that these do not protect the vitals which the shooter is most desirous of reaching. To arrest flight is the most immediate object, and in that connection it might be remarked that the wing bones are nearly always fully exposed. The heart and other internal vitals are likewise ill-protected when the side-shot is taken. Finally, neck and brain hits are always available, especially when firing from underneath. These anatomical objectives constitute so many arguments in justification of moderate size pellets, the odds being thereby loaded in favour of reaching one of the critical places. But as the difference is not considerable, every good shot can demonstrate the wisdom of whatever may be his choice.

Wildfowlers should certainly be chary of attempting to gain extra efficiency by overloading either the powder or shot. The provable gain on the testing range is infinitesimal, but such as it may be is liable to be cancelled by the gun shooting low. Gunmaking progress during the past twenty or more years has followed the line of improving handiness and balance, both developments tending towards barrels rather slender forward, and hence susceptible to downward flip at the muzzles at the moment of shot emergence. Many a gun which delivers its charge true on the mark with any of the modern loads will shoot a foot low when charges of the style current some thirty years ago are tried in comparison. Since successful shooting at maximum ranges depends essentially on centering the bird in the pattern, extra powder or shot is liable to impose a constant error—not much in itself but a definite handicap nevertheless. All things considered, the simple course is the best—namely, to use ordinary equipment, and to exercise craft to get within effective killing distance.

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If what I have written conveys the impression of mere platitudes, my defence must be that years ago I, like most others, was infected

with the virus conveyed by books, that I set to work as far as circumstances permitted to study the technics of wildfowling, but soon discovered that this sport is governed by the ordinary rules of shooting. Its fascination has gripped me all along, and although I have often had occasion to long either for greater skill, or else for some more efficient combination than the standard gun and cartridge, patient investigation has shown the futility of such desires.

On various occasions the favourite weapons of ardent wildfowlers have been submitted to me for test, but none has exhibited that undiluted advantage over the commonplace which would encourage a change. Quite recently I tested an imposing 10-bore, which had given its owner a headache; but try as we would, we could not find a charge which did not scatter, and so waste, the pellets it carried in excess of a 12-bore. Trade is benefited by the constant uprising of new fancies and the ordering of guns for trying them out; but, subject to such exceptions as have been noted, marksmanship, provided it is backed by craft and alertness, is what tells, these qualities of energy needing always to be tempered by the power to control hasty or ill-calculated action.

VIII

THE NATURAL HISTORY OF WILDFOWL

1. THE SHELDUCK AND THE SURFACE-FEEDING DUCKS[1]

PRELIMINARY CLASSIFIED NOTES

[F. C. R. JOURDAIN. W. P. PYCRAFT. A. L. THOMSON]

COMMON-SHELDUCK [*Tadórna tadórna* (Linnæus); *Tadórna cornúta* (S. G. Gmelin). Burrow-duck, bargander, bargoose, ladyfowl, annet; stock-annet (Scotland). French, *tadorne*; German, *Brandgans*; Italian, *volpoca*].

1. Description.—The adult sheldrake may always be distinguished by the crimson beak and white plumage variegated with black and chesnut. There is no marked seasonal change of coloration. Length 25 in. [635 mm.]. (Pl. xx.) The male is distinguished at once by the protuberance at the base of the beak. The head and neck are black with metallic green sheen, the rest of the plumage white relieved by a broad band of bright chesnut encircling the body at the base of the neck, and a broad black band down the middle of the breast. The scapulars and primaries are black and the tail is tipped with black, and the sides of the under tail-coverts are pale chesnut. The speculum has the outer half chesnut-red, the inner half steel-blue. The female lacks the protuberances at the base of the beak, and is slightly duller and smaller than the male. The juvenile plumage recalls that of the adult, but the head and neck are of dull grey-black, the chesnut band encircling the body, and the black band down the breast and abdomen are wanting, and the beak is flesh-coloured, while the legs and toes are of livid flesh colour. The young in down is white, with the crown,

[1] There can be no doubt that the existing systematic arrangement of the Ducks is very unsatisfactory, but having regard to the fact that a thorough study of their structural characters has yet to be attempted, it has been thought inadvisable in this work to depart from the arrangement of the genera adopted by Howard Saunders.—Ed.

hind-neck, and back of a pale brown; before and behind the wings the dark colour of the back trends downwards, forming short transverse bars. [W. P. P.]

2. Distribution. — This is mainly an estuary-haunting species, but occasionally is found breeding at considerable distances from the sea. It nests in fair numbers in suitable localities in our east coast counties, but is scarce in the south-east, though some breed on the south coast from Hampshire westward. On the Welsh estuaries it is very numerous, and is also found on the north-west coasts of England and on the Isle of Man. It is abundant on the east coast of Scotland, but more local on the west side, and is found in the Hebrides and Orkneys, but is of very rare occurrence in the Shetlands. In Ireland it breeds in limited numbers on the low-lying parts of the coast, more especially on the west side. On the Continent its breeding range extends to the Lofodens in Norway, commonly in South Sweden and also in Öland, on the south-west coasts of Finland, according to Buturlin on the Murman coast in N. Russia, as well as from 51° in the Urals south to Transcaucasia and the Black and Caspian Seas. In the southern Baltic and on the coasts of Denmark, the Frisian Islands, N. Germany, and Holland it is common, and also breeds in small numbers locally in North France and at the mouth of the Guadalquivir in Spain. It is said to nest also on the Tunisian coast. In Asia it breeds from Transcaspia and the Kirghiz Steppes up to lat. 53° 27′ in the Tomsk government, Dauria, and probably Manchuria. On migration it ranges to the Mediterranean and N. Africa (about lat. 23°), and in Asia to the Persian Gulf, North India, China, Burma, Formosa, and Japan. It has occurred casually in the Færoes and Iceland. [F. C. R. J.]

3. Migration. — A resident species, whose numbers are augmented in winter by immigrants from the Continent. In Yorkshire large flocks of migrants occur in autumn and in spring, some remaining throughout the winter: occasionally occurring inland (cf. Nelson, *B. of Yorks.*, 1907, p. 432). Three hundred birds were seen at the Tees light-vessel on 13th Jan. 1882 (cf. *Fourth B. A. Migration Report*), while flocks of up to two hundred and one thousand birds have been recorded from Kentish and Welsh waters respectively (cf. Ticehurst, *B. of Kent*, 1909, p. 341; and Forrest, *Fauna N. Wales*, 1907, p. 275). The winter increase is also noticeable in Ireland, where the largest flocks are seen in spring (cf. Saunders, *Ill. Man. B. B.*, 2nd ed., 1899, p. 419; and Ussher and Warren, *B. of Ireland*, 1900, p. 188). Sometimes strikes against the lighthouse lanterns (cf. Nelson, *op. cit.*, p. 433). [A. L. T.]

4. Nest and Eggs.—Occasionally the nest has been found in quite open sites on unfrequented islands, but the normal position is at the end of a tunnel

in the sand, sometimes a rabbit burrow, and at other times excavated by the bird. The distance from the mouth of the hole varies considerably, some nests being as much as 10 or 12 feet from the entrance, while others are only a few feet. (Pl. XVII.) On the Frisian islands artificial holes are freely used to breed in, and it may be said to exist in a partially domesticated state. Other sites occasionally made use of are holes in stone embankments or in the face of a cliff, hollows beneath loose boulders, and in thick gorse bushes. The nest itself is a big bed of down, pale brownish or pearly grey in colour, and large white feathers, barred at the tip with chesnut or dark brown,[1] mixed with dead grasses, moss, leaves, etc., and is formed by the female, though probably both sexes take part in excavation (O. Lee), but this is denied by Naumann. The smooth creamy white eggs are generally from 7 or 8 to 12 in number, but instances of 13 to 17 eggs in one nest are on record, and in Norway 20 and 28 have been found in one nest, obviously the produce of more than one female, as was undoubtedly also the nest with 32 eggs recorded by W. Gyngell (*Naturalist*, 1902, p. 161). Average size of 93 eggs, 2·57 × 1·84 in. [65·5 × 46·9 mm.]. The incubation period is given by Saunders as 28 to 30 days, but Oswin Lee estimates it as 24 to 26 days. It is apparently performed by the duck alone, but according to some writers she is relieved for a short time in the early morning and evening by her mate. This is probably an error of observation, as the drake calls her off and accompanies her on her return to the nest. Full clutches may be met with from about the first week of May onward, usually about the middle of the month, occasionally as early as the end of April, and in the north often not till early in June. Only one brood is reared in a season, though a second clutch may be laid if the first is taken. [F. C. R. J.]

5. Food.—Sandhoppers and other small Crustacea, molluscs, marine worms, and sea-weed. The young partake of the same food, and are assisted in its capture by the female. [W. P. P.]

MALLARD OR WILD-DUCK [*Ánas platyrhýncha* Linnæus; *Ánas bóscas*, Linnæus. Stock-duck (Orkneys). French, *canard sauvage*; German, *März-Ente*, *Stock-Ente*; Italian, *germano real*].

1. Description.—The mallard may be distinguished at all ages by the coloration of the coverts and secondaries forming the speculum. This, in so

[1] For illustrations of the typical feathers found in the nests of the British-breeding ducks, see an article by H. Noble in *British Birds*, vol. ii. pp. 18 and 37, pls. 1 and 2.

far as the secondaries are concerned, is of a rich metallic steel-blue, bounded along its hinder margin by a black-bordered white band, the white area formed by the tips of the remiges. Anteriorly it is bounded by a similar band formed by the tips of the major coverts, but here the black traverses the tips of the feathers. The sexes differ widely in coloration, and the male undergoes a striking seasonal change of plumage. Length 23 in. [584 mm.]. (Pl. XXI.) The characteristic mark of the male is furnished by the middle tail-feathers, which are conspicuously curled, and of a dark glossy green almost black in colour, as are the rump and under tail-coverts. The head and neck are of a rich metallic green. Round the neck is a ring of white. The interscapulars are brownish, the hue varying individually in intensity: the scapulars and breast and flank feathers are greyish white with fine grey vermiculations, while the fore-breast is of a rich dark chesnut. The beak is olive-green and the legs orange, while the iris is hazel. The "eclipse" dress —mid-June to mid-September—differs from that of the female in that the crown, back, and rump are of an almost uniform dusky tint, the scapulars lack the broad sub-marginal and marginal ochreous bands, the wing-coverts are of a uniform grey, and the abdomen and under tail-coverts are heavily spotted. In the duck the plumage is of a dark brown mottled with ochreous; on the crown this mottling has a streaked effect, while on the outer webs of the hinder scapulars this hue forms a pair of broad, curved ochreous bands. The juvenile dress resembles that of the female: but the male may be distinguished by the dusky coloration of the neck, back, rump, and tail; the female by light brown cross-bars on the rump feathers, the sandy yellow streaks on the crown, and the paler lores. She is also smaller than the male. The young in down are of an olive-brown above, with a dark streak before and behind the eye, which contrasts with the golden yellow colour of the side of the head. There is a buff band along the hinder margin of the fore-arm, which partly covers a similar transverse band on the trunk; and there is a further short transverse band across the loins. The under parts are of a pale golden yellow. [W. P. P.]

2. Distribution.—This is by far the commonest and most generally distributed of our British breeding ducks, and breeds in suitable localities throughout the British Isles. Its breeding range extends to the Færoes and Iceland, but the race inhabiting Greenland has been subspecifically separated. On the Continent it ranges up to Finmark in Norway and north of Uleåborg in Finland, while it is not found north of the Arctic Circle in North Russia. South of these limits it is generally distributed over the European continent south to the Mediterranean.

Photo by F. E. Daniel

Common shelduck's nest and eggs in a burrow opened to show same

Photo by J. C. Crowley

Mallard's nest and eggs

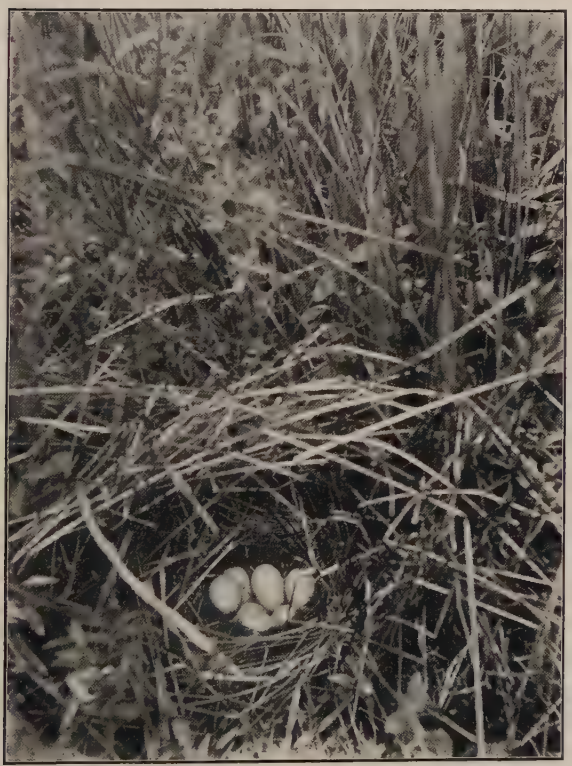

Photo by R. Fortune

Gadwall's nest and eggs (Holland)

Photo by R. Fortune

Shoveler's nest and eggs

It also breeds in the Azores and Canaries, and in North-west Africa from Marocco to Algeria. In Asia it is found across the continent north to about lat. 65° and south to Transcaspia, the Persian mountain ranges, Kashmir, and the Lakes of Tibet; also in Japan and the Kuriles. In America it ranges from the Arctic coasts to the United States, chiefly on the western side of the continent. In winter its migration range extends in the Old World to its southern breeding limits, as well as to Madeira and Egypt in Africa and the Persian Gulf, India, Burma, and China in Asia, while in America it ranges south to Mexico, the West Indies, and Panama. [F. C. R. J.]

3. Migration.—A common resident species, which is even more abundant as a winter visitor and a bird of passage from North Europe. The immigration usually occurs between 12th September and 5th November, and the passage may last till 28th November: the spring passage season is from 25th March to 14th May (cf. Clarke, *Studies in Bird-Migration*, 1912, vol. i. p. 160). In Yorkshire flocks of apparent immigrants have been noted as early as the third week of August, although the majority do not arrive till October or November: after arrival the birds become distributed. Of the same region it is said that "if the weather is fine when migration is progressing, the route taken lies a considerable distance out at sea, but in storms with onshore gales the flocks are compelled to hug the coast, and so are brought under observation" (cf. Nelson, *B. of Yorks.*, 1907, p. 436). And it has also been remarked that great numbers are driven into the creeks and flats of the Thames and Medway estuaries by easterly and north-easterly gales (cf. Ticehurst, *B. of Kent*, 1909, p. 346). In Ireland there is a great augmentation in numbers during December and January, and the new arrivals are said to be distinguishable "by being slighter in body, tired after migration, and more easily decoyed" (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 191). Gregarious, often seen in huge flocks: sometimes strikes against the lighthouse lanterns. [A. L. T.]

4. Nest and Eggs.—Most nests are placed on the ground not far from water, and are generally somewhat hidden by the surrounding vegetation, but it has been known to breed at a considerable distance from water. Not infrequently it nests in pollarded willows or hollow trees: occasionally in ivy covered trees or walls, and in bean or straw stacks, and heaps of faggots. Instances are also on record of its breeding in old nests of both crow and rook, and on the Continent the eggs have been taken in the nests of the goshawk, buzzard, and kestrel. Many of these sites are at considerable heights above the ground. The materials used for the nests are chiefly dry grass with some admixture of moss and dead leaves.

and as a rule a plentiful supply of down, which is dark brown in bulk, with fair-sized light centres and whitish brown tips. The nest feathers are more pointed than those of the Pintail, and are marked with a double brown bar (the upper one being sometimes represented by two spots) and a fan-shaped extension down the shaft to the tip. (Pl. XVII.) The nest is made by the duck alone, and contains as a rule from 8 or 9 to 14 eggs, exceptionally as many as 16. The colour varies considerably; it is usually greenish grey or yellowish grey, occasionally pale blue-green or greenish white. Average size of 270 eggs, 2·21 × 1·61 in. [56·3 × 40·9 mm.]. Incubation is performed by the duck alone, and lasts 25 to 26 days (W. Evans). Heinroth also gives 26 days, but O. A. J. Lee states that the average period is 25 days, but that some eggs hatch on the 22nd day. They are laid in the British Isles from February onward to June, but the most usual time is from the end of March to mid-April. In the Shetlands eggs may be found from mid-May to the end of June (Saxby). Exceptional cases have been recorded of autumn breeding, in September and even in October. Normally the mallard is single brooded, and eight to ten weeks elapse before the young can fly, so that the late hatches are probably those of birds which have lost their first sittings, though it is of course possible that some birds may attempt to breed twice. [F. C. R. J.]

5. Food.—Minute organisms obtained by passing water and ooze through the beak, aquatic insects and their larvæ, worms, slugs, small frogs, small fish, leaves and seeds of aquatic plants, grain, and acorns. The young feed largely on insects, under the guidance of the female, and in the fledgling stage obtain much food by diving, wherein they differ from the adults. [W. P. P.]

GADWALL [*Ánas strépera* Linnæus. Bastard (Kent). French, *chipeau-bruyant*; German, *Mittel-* or *Schnatter-Ente*; Italian, *canapiglia*].

1. Description.—The gadwall may always be distinguished by the coloration of the speculum, the inner half of which is white, the outer black. In front it is bounded by a wedge-shaped patch of black passing towards the tip of the outstretched wing into Indian-red. The sexes differ in coloration, and there is a conspicuous seasonal change of plumage in the male. (Pl. XXII.) Length 20 in. [508 mm.]. The male has the base of the hind-neck, scapulars, and flanks marked by coarse vermiculations of black and white, and the minor coverts rich Indian-red. The crown is black, more or less markedly barred with brown, and the side of the head and neck are buffish white, mottled with brown. The fore-breast is white

with concentric bars of black, while the breast and abdomen are white. The rump and under tail-coverts are of a dark glossy green, almost black. In his "eclipse" dress—June, September—the back is dusky, transversely barred with white: the minor coverts are marked like the back: the rump is of a dusky brown, and the upper tail-coverts are barred with buff. The fore-breast is buff with large brown spots; while the mid-breast is white with short, oblong, incomplete dusky bars. The female resembles the female mallard, but may at once be distinguished by the speculum, which differs from that of the male only in its smaller size, and the absence of red on both speculum and minor coverts. The juvenile dress resembles that of the female, but males are darker on the back than females of the same age, and in this they recall the adult male in his "eclipse" dress. The young in down differs from the young mallard of the same stage in that the dark band before and behind the eye is narrower. [W. P. P.]

2. Distribution.—As a breeding species in the British Isles the gadwall is confined to East Anglia and one or two localities in Southern Scotland. It breeds now in some numbers in Norfolk, especially at Merton, and also locally in Suffolk. In Scotland it is known to have bred in 1909 and 1910 at a loch in the Forth area, as well as in Peebles in 1906. It has not yet been proved to nest in Ireland, but owing to its inconspicuous colouring is apt to be overlooked. Outside the British Isles a few pairs breed in North Iceland, and on the Continent it is not uncommon in Svearike and Gotarike in South Sweden; it breeds locally in Germany, Holland, and Denmark, and also in Moravia, Galizia, and Hungary; while in Russia, though recorded from Archangel, it is chiefly confined to the south (Poland and the governments of Moscow, Riazan, Kazan, and Perm). It also breeds in Bulgaria and the Dobrogea, probably in Thessaly, and nests not uncommonly in Southern Spain. Salvin and Tristram found nests at Zana in Algeria in 1857. In Asia its breeding range extends from Transcaspia, Turkestan, and the south of the Tobolsk and Tomsk governments to lat. 60° N. in East Siberia; and in North America it inhabits the temperate parts of the continent south to Texas. Its migration range in the Old World extends to North Africa and Abyssinia; in Asia to the Persian Gulf, India (except in the extreme south), Burma, China, Japan, etc., and in America to Mexico and Florida, while as a casual it has occurred on the Kuriles and Commander Isles, and in the Bermudas, Cuba, and Jamaica. [F. C. R. J.]

3. Migration.—A resident species and also a winter visitor from the Continent: mainly a very irregular and uncertain winter visitor, usually arriving some time between 23rd September and 29th October, but exceptionally as early as

26th August (cf. Clarke, *Studies in Bird Migration*, 1912, vol. i. p. 160). On the east coast of Great Britain it is decidedly scarce, and it is surprising that its autumn and winter visits to Kent have not become more frequent with the increase of the species in Norfolk (cf. Ticehurst, *B. of Kent*, 1909, p. 350). On the west of Scotland it is more often recorded, and it appears to be comparatively numerous in some places. But in Dumfriesshire it has only been recorded on two occasions (cf. Gladstone, *B. of Dumfries.*, 1910, p. 268), while it is rare (chiefly recorded in December) in North Wales (cf. Forrest, *Fauna N. Wales*, 1907, p. 277). To Ireland it is a scarce winter visitor to all parts, very irregular as to locality but perhaps most frequent on the west (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 192; and Saunders, *Ill. Man. B. B.*, 2nd ed., 1899, p. 425). As a migrant it is usually recorded as being in small parties. [A. L. T.]

4. **Nest and Eggs.** — The nest is placed on the ground, generally in a dry place, but not far from water, and is partly concealed by clumps of rushes, grass, heather, etc., or in some cases under shelter of a bush. Dry grasses are the chief material used in forming the nest, and a plentiful supply of down is added, which is very dark with small lighter centres and distinct greyish white tips: the duck builds. (Pl. XVII.) Noble describes the nest feathers as "small, light in colour, with irregular darker markings in the centre, but lighter towards the tips." The eggs range from 8 to 13 in number, and are buffish white in colour, without any tinge of green. Average size of 100 eggs, $2{\cdot}05 \times 1{\cdot}56$ in. [$52{\cdot}2 \times 39{\cdot}6$ mm.]. Incubation is performed by the duck alone, and lasts 26 days according to Heinroth. Nahlik's estimate of 21 days is probably too low. The average time for full clutches seems to be about the second or third week of May, but fresh eggs may be obtained till the end of the month, and in Iceland early in June. Only one brood is reared during the season. [F. C. R. J.]

5. **Food.**—Aquatic insects and their larvæ, small fresh-water Crustacea and water-snails, small frogs, worms, and occasionally moths and butterflies; seeds and leaves of aquatic plants, and, in India, rice. The young feed on insects and their larvæ, and are accompanied in the search for food by the female. [W. P. P.]

SHOVELER [*Spátula clypeáta* (Linnæus). Spoonbill, broadbill, rattlewing; Britannia (Moray). French, *souchet*; German, *Löffel-Ente*; Italian, *cucchiarone*].

1. **Description.** — The shoveler may at all ages, save in the downy stages, be distinguished by the great breadth of the beak and the length of the horny

lamellæ along the edges of the jaws. The sexes differ conspicuously, and there is a marked seasonal change of plumage in the male. (Pl. XXIII.) Length 20 in. [508 mm.]. The male has the wing-coverts of a pale blue, the speculum green with a metallic sheen, a broad white band along its anterior border, and a narrow white line along its hinder edge. The head and neck are of a rich dark metallic green ; the foremost scapulars, the hind-neck, and the fore-breast form a continuous white area. The hinder scapulars are blue with white outer webs, and these are succeeded, tailwards, by black feathers marked by broad white shaft-streaks. The interscapular area is dusky. The breast and abdomen are dark mahogany-red, and the under tail-coverts are black glossed with green. The beak is black, the legs orange colour, and the iris yellow. In the eclipse dress the head and neck are much as in the female, but the fore-breast is dusky with V-shaped loops of buff, while the hind-neck is dusky with a few transverse bars of buff, and similar bars occur also on the scapulars. The breast and abdomen are of a dull, pale, mahogany colour, and the latter is spotted with black. The wings are as in the supernuptial dress. The female has the wing-coverts grey-blue, the speculum as in the drake, but with a much narrower anterior bar of white. The upper parts are of a dusky hue with pale wood-brown striations on the crown, and broad marginal bands of the same hue on the scapulars, and interscapulars; on the dusky rump are wavy semicircular loops of wood-brown. The breast is of a dark wood-brown with obscure dusky mottlings. The juvenile dress resembles that of the male in eclipse, but differs in the absence of transverse bars of buff on the hind-neck. The downy young differs from the downy mallard in lacking the buff bar on the wing and the brownish buff colour of the neck. [W. P. P.]

2. Distribution.—There has been a considerable increase in the breeding range of this species in the British Isles of late years, and it has now colonised practically all the northern counties of England, all the east and south coast counties except Cornwall, and has also established itself at various localities in the midlands, chiefly in the east and north-west. In Scotland it is principally confined to the Forth, Tay, Tweed, and Solway areas, but has also been found breeding sporadically even in the extreme north of the mainland, as well as in the Orkneys, Tiree, and in the Outer Hebrides since 1903. In Wales it is still scarce, but has bred in Anglesey and once in Merioneth. In Ireland it is increasing its range, and now breeds in every province in small numbers. On the Continent it nests in many parts of Sweden, especially in the south, and possibly also in South Norway; on the Baltic islands, the coast of Finland, and Lake Ladoga and

the rivers flowing into the Arctic Ocean in North Russia. From here it ranges southward through Denmark, the Low Countries, Germany, the Baltic provinces, Austro-Hungary, Roumania, South Russia, Cyprus, and occasionally breeds in Spain. In North Africa it has been recorded as nesting in Algeria, Tunisia, and Egypt, while it is said also to breed in Nubia and Abyssinia. In Asia it breeds on the rivers Ob, Yenisei, Lena, and Kolyma to 68° on the west and 68½° on the east side, and south to N. Persia, Turkestan, and Kashgaria. In North America its breeding limits extend north to Alaska and south to Texas. The winter range of this species is very extensive, and reaches to Senegambia and Somaliland in Africa, and in Asia it visits the countries bordering the Indian Ocean, China, Japan, as well as the Philippines, Australia, and the Gilbert Isles. In America it ranges to Colombia, the West Indies, and Hawaii. As a casual it has occurred in the Bermudas and once near Cape Town. [F. C. R. J.]

3. Migration.—A very locally distributed breeding species, whose numbers are greatly augmented in winter by immigrants from the Continent: such immigrants have been recorded as early as 5th September (cf. Clarke, *Studies in Bird-Migration*, 1912, vol. i. p. 160). Our breeding birds are probably mainly resident, becoming more widely distributed in winter; but in Kent the breeding birds are described as "strictly summer visitors," arriving about mid-March, observed in pairs or parties till mid-April, and then at their nesting haunts till early August, after which they are found on the coast till mid-September; winter visitant examples are recorded from October or November onwards (cf. Ticehurst, *B. of Kent*, 1909, p. 352). A few nest in North Wales, but their numbers are increased in winter, when they are recorded most frequently from the coasts (cf. Forrest, *Fauna of N. Wales*, 1907, p. 278). In Yorkshire it is best known as an uncommon spring and autumn migrant, although it is also a nesting species, and is occasionally found in winter (cf. Nelson, *B. of Yorks.*, 1907, p. 451). To Ireland, where it breeds in every province and is decidedly on the increase, there is also a considerable augmentation in numbers during the cold season. [A. L. T.]

4. Nest and Eggs.—The nest is often placed on the ground in a meadow, in heather on moorlands, or surrounded by rank vegetation, bracken, etc.; more rarely among dead reeds or in rushes. The distance from the water's edge is very variable, and is sometimes considerable. The nest hollow is filled with dead grasses and other vegetable matter mixed with down, and is the work of the female. The down is much like that of the wigeon, being dark brown with indistinct light centres, but the feathers are distinctive, the larger ones being deep brown, with a heavy blotch near the tip and a band below, while the small ones have a median

blotch. (Pl. XVII.) The eggs are usually 8 to 12, occasionally as many as 14 in number, and are pale greenish grey as a rule, sometimes grey-buff or rarely yellowish, but never so light a cream as those of the wigeon, which otherwise they resemble. Average size of 100 eggs, 2·05 × 1·45 in. [52·2 × 37 mm.]. Incubation is performed by the duck alone, and lasts 23 to 24 days (Heinroth *in litt.*). Other estimates vary from 21 to 28 days, but are probably only approximate. Full clutches may be found exceptionally as early as the first week of April, but usually about the third week in that month, and thence onward through May, while in the Orkneys fresh eggs have been found till late in June. Only one brood is reared during the season. [F. C. R. J.]

5. Food.—The tender shoots of grass and other weeds and water-plants; but mainly on small Crustacea and other organisms obtained from mud, small molluscs, and aquatic insects and larvæ. The young feed mainly on aquatic insects, and are guided in their search by the female. [W. P. P.]

PINTAIL [*Dáfila acúta* (Linnæus). Sea-pheasant. French, *pilet*; German, *Speiss-Ente*; Italian, *codone*].

1. Description.—The adult pintail is to be distinguished by the speculum, which is of a rich dark green, with purple and bronze reflections, and bounded in front by a band of cinnamon formed by the tips of the major coverts, and behind by a sub-marginal band of black and a very broad terminal fringe of white. The sexes differ conspicuously, and there are distinct seasonal changes of plumage. (Pl. XXIV.) Length 29 in. [736 mm.]. The male in his full dress has the head of a dark brown with lilac gloss on each side, the back of the neck black; the fore-neck white, which, in the form of a narrow band, is continued up the side of the neck to the head; while it extends downwards to include the whole of the under surface save the flanks, which are vermiculated with narrow lines of grey and white. The wing-coverts are of a brownish grey, while the long inner secondaries and elongated hinder secondaries are black edged with white. The lateral upper tail-coverts and the under tail-coverts are velvety black, the latter contrasting with a buff patch on either side of the abdomen behind the flank feathers; the central tail feathers are black, and much elongated. The beak, legs, and toes are slate-grey; the iris is brown. In eclipse the fully adult bird has the head and neck pale brown, finely striated with darker brown, but the crown is dusky, and round the middle of the neck is an ill-defined whitish band, with grey striations. The base of the hind-neck, interscapulars, scapulars, and rump are dusky with indistinct grey

and white vermiculations, and narrow conspicuous transverse wavy bars of white. The breast is dull white with dusky mottlings, but the abdomen and under tail-coverts are much striated. The flanks are dark brown with irregular loops of white. The wing remains unchanged, in so far as the smaller coverts and speculum are concerned. In immature birds the hind-neck, interscapulars and scapulars are of a dark slate, almost black, with strongly marked transverse bars of buff, but the vermiculations of the adult eclipse dress are wanting: while the small wing-coverts have narrow white edges, and the whole of the under surface is marked by heavy dusky striations. The female differs from the male in eclipse in having the back marked by broad V-shaped loops of buff instead of transverse bars, while the speculum is somewhat duller. The juvenile dress recalls that of the adult male in eclipse rather than of the female, the back being of a dark slate with transverse bars of buff: the speculum at this period is of a dirty brownish grey colour and with lustre of any kind, while the under parts from the fore-breast backward are heavily striated. The young in down differs from the mallard nestling in having the sides of the head brown, and only a narrow superciliary stripe, while the short buff colour bars of the wings and loins are wanting. [W. P. P.]

2. Distribution.—In the British Isles is only known with certainty to breed in Scotland, where it has established itself of late years. A fair-sized colony has been known to exist at Loch Leven, Kinross, since 1898, and probably for some years before: it is also well established in the Orkneys, and has bred in the Shetlands, Skye, S. Uist, and Selkirk. There is no recent proof of its nesting in Ireland. Outside the British Isles it has bred in the Færoes, and is not uncommon in Iceland; while on the Continent it nests in Norway up to North Finmark and in Sweden to Tornea Lappmark; in Finland and Russia it is generally distributed from the Arctic Ocean and White Sea southward, except in the Baltic provinces, the Taurida, and the Astrakhan government. It also breeds in Holland, Denmark, North Germany, Austro-Hungary, and Roumania, while a few pairs nest apparently in the Camargue and certainly in South Spain. In Asia it ranges north to 72° on the Yenisei and is plentiful on the Kolyma (lat. 69½°), while to the southward it is known to breed in Transcaspia. In North America it has been met with from Alaska, Hudson's Bay territory and Labrador to Dakota, Idaho, and Montana. Its winter migrations extend to Northern Africa and the Egyptian Sudan; Arabia, India, Ceylon, Burma, China, Formosa, and Japan in Asia; the Indo-Malay archipelago (Borneo, the Philippines, etc.), Laysan, Hawaii; while in America it reaches Costa Rica, Porto Rico, and Cuba. It has also occurred in Greenland. [F. C. R. J.]

Photo by R. Fortune

Pintail's nest and eggs

Photo by W. Farren

Teal's nest and eggs

Photo by R. Fortune

Garganey's nest and eggs

Photo by R. Fortune

Wigeon's nest and eggs

3. Migration.—A scarce resident, breeding very locally: also a regular winter visitor and a bird of passage from Northern Europe, arriving some time between 17th September and 11th October, but exceptionally as early as 11th August (cf. Clarke, *Studies in Bird-Migration*, 1912, vol. i. p. 160). As a winter visitor to Great Britain it is chiefly found on the coasts, but even there it is nowhere abundant: the autumn immigrants rarely linger long in the north of Scotland. A good many birds, indeed, appear to pass right through our area, as an increase in numbers is noticeable in spring: even in the south this return passage lasts till mid-April (cf. Ticehurst, *B. of Kent*, 1909, p. 354). In Ireland it is commonest in February, but is very local, though the localities are widespread: the southern and western districts are the most favoured (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 196; and Saunders, *Ill. Man. B. B.*, 2nd ed., 1899, p. 429). A report on the results of marking large numbers of pintail in Denmark is awaited with interest. Usually recorded in small parties of from two or three birds to a score or more. [A. L. T.]

4. Nest and Eggs.—The nest is usually placed on the ground in a dry place, sometimes sheltered by the surrounding vegetation or under cover of a low bush. It is constructed by the duck, and dry grasses and other vegetable matter are used, together with a good supply of down, which is dull sooty-brown in colour, lighter than that of the longtailed-duck, and with whitish centres. (Pl. XVIII.) Some feathers show a brown bar with extension down the shaft to the tip; others have a median blotch and a bar with median extension, almost in the shape of a fleur-de-lys. The eggs are usually buffish or yellowish green, but some clutches are cream coloured without any green tinge. The clutch generally consists of 7 to 10 eggs, which are decidedly smaller than those of the mallard, but do not differ much in size from those of the shoveler and wigeon. Average size of 101 eggs, $2{\cdot}16 \times 1{\cdot}52$ in. [$55 \times 38{\cdot}8$ mm.]. Incubation is performed by the duck only, and lasts 22 to 23 days according to Heinroth. Hantzsch gives $3\frac{1}{2}$ weeks, and Naumann says that it is less than four weeks. The breeding season is rather early, and full clutches may be found in the first few days of May in Scotland and Denmark, but in the north of Europe they may be found in early June, and Seebohm took eggs on the Yenisei in July. Only one brood is reared during the season. [F. C. R. J.]

5. Food.—Insects and their larvæ, molluscs, small Crustacea, and water-plants, especially *Equisetum*. The young feed at first mainly on insects and their larvæ. [W. P. P.]

TEAL [*Néttion crécca crécca* (Linnæus); *Néttion crécca* (Linnæus). Throstle-teal, jay-teal; crick (Norfolk). French, *sarcelle d'hiver*; German, *Krick-Ente*; Italian, *alsavola*].

1. Description.—The speculum in the teal suffices to distinguish it in both sexes and at all ages, the outer half being velvety black, the inner metallic green, while it is bounded in front by a rust-coloured or occasionally white bar, formed by the tips of the major coverts, and behind by a very narrow white line formed by the tips of the remiges. The sexes differ markedly in coloration, and there is a conspicuous seasonal change of plumage in the male. (Pl. XXII.) Length 14·5 in. [368 mm.]. The male has the head and neck of a rich chesnut relieved by a broad band of dark metallic green extending from the eye backwards on to the neck, and bordered with a narrow edging of buff, which, as a narrow line, runs forward from above the eye downwards to the beak. The upper parts are finely pencilled with grey and white vermiculations, but the wing-coverts are brownish grey, and the hinder scapulars are greatly elongated and coloured, and form a conspicuous longitudinal band, velvet black along its external, and cream coloured along its internal border. The lateral upper tail-coverts and the under tail-coverts are of a velvety black. The fore-breast is white spotted with black, and the flanks are vermiculated like the back, while the breast and abdomen are white, the former with large round black spots. The beak is black, and the legs and toes dusky. In its eclipse dress—July to October—it differs from the female in having the abdomen heavily marked with oval, dusky spots, and the back dusky with *narrow* transverse bars of buff. The female differs from the female mallard chiefly in its much smaller size, and in having the base of the hind-neck ("upper-mantle") barred with *broad* bars of ochreous buff, in having the loop-like markings of the hinder scapulars and long inner secondaries of a rufous tinge, and the rump transversely barred with grey, while the breast is white save in August, when it becomes heavily spotted. The juvenile dress differs from that of the adult female in having the crown of the head and the back feathers of a uniform dusky hue and a duller speculum. The young in down differs from the young mallard in lacking the buff markings on the upper surface, and in having the sides of the head and breast pale brown instead of golden yellow. [W. P. P.]

2. Distribution.—On the whole a widely distributed species in the British Isles, nesting in most of the English counties, especially on the east coast and in the north of England. It is rather sparsely distributed in the southern and midland counties, but is commoner in Wales. In Scotland it is very general on

the mainland, and on all the island groups, having been first recorded as breeding in the Outer Hebrides in 1901. In Ireland also it breeds in all districts in limited numbers. Outside the British Isles it nests in Iceland, and on the Continent it is generally distributed in suitable localities from Lapland and the shores of the Arctic Ocean in North Russia to the shores of the Mediterranean, but it is comparatively scarce in the countries of Southern Europe, and it is doubtful whether it breeds in Italy; has only exceptionally been found nesting in Spain, and does not breed in Greece as far as is known. It nests in Sardinia, and is said to have bred in the Azores (Godman), while in Asia it ranges across the whole continent, east to Kamtschatka and north to about 70°. It breeds in the Kuriles and has occurred in Alaska, but is replaced by an allied race in North America, though it has strayed to Greenland and the eastern coasts. In winter its migrations extend to Madeira, the Canaries, and North Africa, south to Haussaland, the Blue Nile and Abyssinia; while in Asia it ranges to Socotra, the Persian Gulf, India, Ceylon, the Malay Peninsula, China, Formosa, Japan, and also to the Philippines. [F. C. R. J.]

3. Migration.—Found all the year round in our islands: the birds which nest with us probably include both resident and summer visitant individuals. The species is, however, most abundant as a winter visitor and a bird of passage from Northern Europe. The autumn immigration takes place between 6th September and 28th November, but the season of the passage movements is given as from 30th August to 29th November; the spring passage season is from 25th March to 11th May (cf. Clarke, *Studies in Bird-Migration*, 1912, pp. 136, 160). It is resident in Yorkshire, and the first immigrants appear in August, great flights following in September and October, after which the birds disperse; the return passage takes place in March and April (cf. Nelson, *B. of Yorks.*, 1907, p. 455). In Kent the immigrants appear early in September, and are further increased in hard weather: the birds nesting in that county are summer visitors, arriving in March and moving south early in August (cf. Ticehurst, *B. of Kent*, 1909, p. 355). A few nest in North Wales, but in winter it becomes abundant (cf. Forrest, *Fauna N. Wales*, 1907, p. 281). The immigrant birds appear in Ireland late in October or early in November, afterwards dispersing (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 198). Large numbers of teal have been marked on passage in Denmark, and the following is a summary of the results given in the First Report:—One hundred and two birds were caught in a decoy on the island of Fanö, off South-western Denmark, in October 1907; these were "ringed" and released, and twenty-one of them were

reported from various localities during that and the following winter. Two were killed in Holland (22nd October and 22nd November 1907), four in the south-western shires of England (Herefordshire, 5th January; Cornwall, 17th January; and Hampshire, 30th January and 30th December 1908), five in Ireland (Co. Limerick, 10th December 1907; Co. Kerry, 31st December 1907; Co. Fermanagh, 24th February 1908; Queen's Co., 28th February 1908; and Co. Galway, 21st August 1908), eight in Western France (November and December 1907; and January, February, and September 1908), one in Southern Spain (Guadalquivir estuary, 2nd December 1907), and one in Northern Italy (river Po near Parma, 4th December 1908): further, one was recaught at Fanö (5th November 1908), and a second on another of the North Frisian islands (Pellworm, 1st October 1908), while one was found not far from Stockholm (12th April 1912), giving an indication of the summer quarters of the birds concerned. Of the above cases, that of a teal marked on passage in Denmark in October 1907, and shot in Co. Galway on 21st August 1908, deserves special attention: the bird may possibly have summered in the British Isles for some reason—when shot it was in good condition, but alone. (Cf. Mortensen, *Vidensk. Meddel. fra den naturhist. Forening i Köbenhavn*, 1908, pp. 127-139). The teal is a gregarious migrant, and often met with in great numbers: sometimes strikes against the lighthouse lanterns. [A. L. T.]

4. **Nest and Eggs.**—The nest is frequently found among heather on moorlands, sometimes in a tuft of rushes, under a bush or in a wood. The hollow is scantily lined with dead leaves, grasses, etc., by the duck, and freely lined with down as incubation proceeds. (Pl. XVIII.) The down is dark blackish brown, with light centres, but lacks the white tips characteristic of the garganey. (Pl. U.) Nest feathers "light stone colour, with broad dark patches" on each side, "extending nearly to the tip of the feather" (Noble). The eggs are usually 8 to 15 or 16 in number, smaller than any other of our British-breeding ducks except the garganey, and are pale creamy white with a faint greenish tinge, which is characteristic. Average size of 100 eggs, 1·77 × 1·29 in. [45 × 32·8 mm.]. Incubation is performed by the duck alone, and ends on the 22nd day (W. Evans): Hantzsch gives 20 days from the last egg, but H. S. Gladstone estimates it at 28 days! Saunders states that the eggs are usually laid early in May, but nests may frequently be found with full clutches during the last fortnight of April in the south of England, and in Northern Europe often not till June. Only one brood is reared during the season normally. [F. C. R. J.]

Photo by R. B. Lodge

Pochard's nest and eggs

Photo by W. Farren

Tufted-duck's nest and eggs

Photo by F. B. Kirkman

Eider-duck's nest and eggs (Farnes)

5. Food.—The tender shoots and leaves of aquatic plants, insects and their larvæ, small Crustacea. The young feed largely on aquatic insects, and are aided in their search and guarded by both parents. [W. P. P.]

GARGANEY

[*Querquédula querquédula* (Linnæus); *Querquédula círcia* (Linnæus). Crick, summer-teal; summer-crick, cricket-teal (Norfolk). French, *sarcelle d'été*; German, *Knäk-Ente*; Italian, *marzaiola*].

1. Description.—The garganey may at all times be distinguished by the pale metallic green colour of the speculum, which is bounded before and behind by a broad white band. The sexes differ conspicuously, and the male displays a striking seasonal change of coloration. (Pl. XXIII.) Length 16 in. [406 mm.]. The male in "full" plumage has the lesser wing-coverts of a pale French grey, the head and neck dark cinnamon-red with hair-like striations of white, a broad white superciliary stripe, and a black chin. The long hinder scapulars are of a French grey colour, and these are succeeded by others which are black with broad white median shaft-streaks. The sides of the base of the neck are black with loops of buff, and the fore-breast is of a rufous buff barred with black. The flanks are coarsely vermiculated with dark grey on a white ground, and the abdomen is white obscurely freckled with grey, while the under tail-coverts are buffish white, obscurely spotted with black, thereby differing from all the other surface-feeding ducks, wherein these coverts are velvety black. In his eclipse dress the male retains the coloration of the supernuptial, or "breeding" dress, in so far as the wings are concerned; for the rest he resembles the female save that the fore-breast is white with subcrescentic bars of dark brown. The female lacks the brilliancy of colour which characterises the male in regard to the speculum, and has the wing-coverts of a dark grey: the feathers of the upper parts are of a dusky hue margined with buffish white: there is a short white stripe behind the eye, another from the eye to the base of the beak, and there is a dull white patch in the region of the lores. The throat is white, the middle of the neck buffish white with sepia striations, and the flanks are sepia coloured margined with white. The young in down is of a dark chocolate colour, and has the sides of the head pale chesnut, with a chocolate patch behind the eye, and a sinuous line of the same hue along the face curving up behind the ear. Behind the wing is an S-shaped loop of dull white, and there is a buff spot on the thigh. The throat and breast are pale buff, the fore-breast rufous, and the abdomen buff with dusky mottlings. [W. P. P.]

2. Distribution.—This species only breeds with us in very small numbers, and is very local. The only counties in which it breeds at all regularly are Norfolk, where it is diminishing in numbers, and in smaller numbers in Suffolk and Kent. It formerly bred in Northumberland, and has nested within the last thirty years in Durham, Yorkshire, Essex, Hants, and Somerset. No instances of breeding are known from Scotland or Ireland. On the Continent it is said to breed in Iceland and at Jaederen in Norway, nests in Sweden up to about lat. 60°, and perhaps also in Jemtland, in Finland, and from the Archangel and Vologda governments and the Baltic provinces in Russia southward. In Denmark, Holland, and some parts of North Germany, as well as in Hungary, it is fairly common, and breeds in smaller numbers in France, North Italy, the Balkan states, Greece, Sicily, probably in Crete, Cyprus, and the southern governments of Russia. In Asia it breeds in Asia Minor, Transcaspia, and on the Ob north to the Arctic Circle, Turkestan, the Tomsk government, near Irkutsk, in Ussuria, Kamtschatka, and Mongolia. Its migration range extends to Abyssinia, Somaliland, the Egyptian Sudan, and British East Africa: in Asia to Arabia, Persia, India, Ceylon, the Malay Peninsula, China, and Japan; the Sunda Isles, Moluccas, Philippines, and Celebes. [F. C. R. J.]

3. Migration.—Apart from the small British breeding stock (see preceding paragraph), this species is an uncommon bird of passage to our islands, very rare or unknown in some parts. In Kent the breeding birds are summer visitors, sometimes arriving in March, but more usually in April; they seek the coast about the middle of July, and probably leave a month later (cf. Ticehurst, *B. of Kent*, 1909, p. 357). The southern and eastern parts of England are those in which the passage movements in early March and in autumn are most marked (cf. Saunders, *Ill. Man. Brit. B.*, 2nd ed., 1899, p. 435). To Ireland the garganey is a very rare bird of passage, occurring chiefly in the south and west, and in March or April, although also in January and February (cf. Saunders, *loc. cit.*; and Ussher and Warren, *B. of Ireland*, 1900, p. 198). [A. L. T.]

4. Nest and Eggs.—The nest may be found in meadows, among heather or rank vegetation, and in marshes, and is a mere depression in the ground, lined with grasses and other vegetable matter, to which down is added, sometimes only while incubation is going on. (Pl. XVIII.) It is formed by the duck alone, and generally contains 6 or 7 to 10 eggs, occasionally as many as 13, which differ little in size from those of the teal, but are a warm creamy yellow in colour, and lack the greenish tinge. The down is also distinctive, being smaller than that of the teal, sooty brown in colour, with light centres and distinct light tips.

The feathers have a dark median patch, which does not reach either to the tip or edges of the feather. Average size of 77 eggs, 1·77 × 1·28 in. [45 × 32·5 mm.]. Incubation is performed by the duck alone, and lasts, according to Heinroth, about 24 days; but only 22 days by Winel's estimate. Full clutches may be found in East Anglia during the last fortnight of April or early in May, sometimes in Central Europe as late as the end of June, possibly in the case of birds which have lost their first clutch. Only one brood is reared during the season. [F. C. R. J.]

5. Food.—Small fish, aquatic insects, small molluscs, and aquatic vegetation. The young feed largely on aquatic insects, small molluscs, and Crustacea, and are guided in their search for food by the female. [W. P. P.]

WIGEON

[*Maréca penélope* (Linnæus). Lady-wigeon; russiannett (Lancashire); winder, pandle (Kent); whew (Northumberland); whew-duck. French, *canard siffleur*; German, *Pfeif-Ente, Bläss-Ente*; Italian, *fischione*].

1. Description.—In the male wigeon the speculum is almost black, save for a broad band of metallic green which forms its anterior border. It is bounded in front by a black band formed by the tips of the major coverts, which else, with the rest of the wing-coverts, are white. The female may at once be distinguished from other species of the same sex by the fact that the speculum is of a dusky grey, bounded in front by a white bar. The sexes differ conspicuously, and there is a striking seasonal change of plumage in the male. (Pl. XXIV.) Length 18·5 in. [469 mm.]. The head and neck of the male are of a chesnut-red, save the crown which is cream coloured, while the eye is surrounded by a broad metallic green ring, and metallic green spots besprinkle the sides of the head and neck. The interscapulars, inner scapulars, rump, and flanks are marked by fine grey and white vermiculations. The outer web of the secondary overlapping the inner border of the speculum is white, the next three remiges of the series are velvet black with white edges, and the lateral upper tail-coverts and under tail-coverts are black. The fore-breast is of a greyish pink tinge, while the breast and abdomen are white. The beak is blue, tipped with black, the feet and legs are lead coloured, and the iris dark brown. In the eclipse dress the plumage differs from that of the female in that the crown is dusky, slightly spotted with brown, the sides of the face and neck mottled closely with grey and white, and the whole of the rest of the upper surface is dusky, transversely barred with buff; while the abdomen is

heavily spotted with grey on a buff ground, the under tail-coverts are dull white heavily spotted with dark grey. The coloration of the female resembles that of the female mallard, differing mainly therefrom in having the feathers at the base of the hind-neck marked by very broad transverse bars and loops of buff, and the sub-marginal and marginal bands of the long inner secondaries rufous instead of buff; and finally, the speculum is dusky grey, bounded in front by a white bar. The juvenile dress differs from the adult female in having the back feathers dusky, margined with a narrow edging of dull grey, interspersed with which are a few, sparsely distributed, indistinct transverse bars of buff. The downy nestling is distinguished by the absence of a basal streak, the almost uniform brown colour of the upper parts showing only a faint buff bar along the wing, and the rufous colour of the cheeks and throat. [W. P. P.]

2. Distribution.—The wigeon breeds in considerable numbers in the north of Scotland, especially Sutherland, and less commonly in Ross, Caithness, and Cromarty. Of late years it has extended its range southward, and has bred in Argyll, Perth, the Forth area (Kincardine), as well as Roxburgh, Selkirk, and Kirkcudbright. It has also nested on Coll, the Orkneys and Shetlands. In England apparently wild birds have bred at one locality in Cumberland, and nests have been found in Yorkshire. Apparently it has also nested once in Merioneth. These latter records may be due to the breeding of young birds hatched in captivity. Although suspected of having bred in Ireland, proof is still wanting. Outside the British Isles it has probably bred in the Færoes, and nests commonly in Iceland: is abundant in Norway and Sweden as well as in Finland, while in Russia it ranges to Lapland, the White Sea, and the southern part of the tundra which borders on the Arctic Ocean. It has bred on Waigatz and extends in South-east Russia to Astrakhan and Transcaucasia, as well as to the Crimea, but is absent from the south-west. It also breeds in very small numbers in East Prussia, and possibly a few pairs may nest in other parts of North Germany, in Denmark, and in Holland. In Asia it ranges north to 71° on the Boganida and 69° on the Kolyma, south to Ussuria, the Altai, and near Tomsk. It is also found on the Aleutian Isles and in Alaska. In winter it migrates south to Madeira, North Africa, and south-east to the Egyptian Sudan and Abyssinia, while Asiatic birds reach Persia, India (except in the south), Burma, China, and Japan, to Borneo, the Sunda and Marschall Islands: in America to California on the west, and the Carolinas and Virginia on the east: casual in Greenland. [F. C. R. J.]

3. Migration.—A considerable number are resident in or summer visitors

to our islands, breeding in some parts of Scotland (see preceding paragraph), but the species is much more abundant as a bird of passage and a winter visitor from Northern Europe. As a winter visitor the wigeon may arrive as early as 5th August, but more usually does so between 9th September and 16th November, while the period of the autumn passage is given as from 30th August to 23rd November, but principally October: the spring passage is from 25th March to 11th May and 12th June (cf. Clarke, *Studies in Bird Migration*, 1912, vol. i. pp. 136, 160). On the Yorkshire coast it is generally young birds that are noted in August and September, both old and young arriving in October and November; but adult females are said to be very scarce in winter in the Tees and Humber estuaries (cf. Nelson, *B. of Yorks.*, 1907, p. 459). The young birds are also noted first, towards the end of September, in Kent (cf. Ticehurst, *B. of Kent*, 1909, p. 359). A few reach Ireland by the end of August, but the main influx takes place between 10th October and the middle or end of November, the numbers varying with the season: the period of the return movement is from mid-March to mid-April, sometimes lasting till May (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 200). As a winter visitor the wigeon is gregarious, and is found on both coastal and inland waters. A passage movement has been described as follows: "Off the Cleveland coast, the wigeon is very frequently observed passing alongshore, to the north-west, on migration, and at times comes within range of the fowlers stationed on the 'scars' or sand-hills, who take toll of their numbers. In some seasons, when favourable winds from the east or north-east prevail at the time of the full moon, immense flights are seen; I have noticed them incessantly from early morn till noon, in flocks numbering several hundred birds; such was the case in the first week of November 1878, on 1st October 1887, the 13th and 14th October 1894, and the 29th and 30th October 1901" (Nelson, *loc. cit.*). Two records of marked birds throw valuable light on the movements of our Scottish native wigeon: out of a brood of five wigeon ducklings marked on 19th June 1909 on Loch Brora, Eastern Sutherland, one was caught in a duck decoy at Westpolder, Ulrum, Groningen, North-eastern Holland, on 3rd September 1909, and another was shot in England, on the river Trent, four miles above Gainsborough, early in January 1911 (cf. Thomson, *British Birds*, vol. v. p. 98). [A. L. T.]

4. **Nest and Eggs.**—The nest is usually placed on the ground, rarely more than 20 yards from the water, amongst heather; sometimes in rushes, grass or coarse herbage, and is composed of grasses, moss, etc., mixed with down, and is the work of the duck. (Pl. XVIII.) The down is dark sooty brown with light

centres, but the nest feathers are quite distinctive, 'being white, sometimes with grey centres, which spread to the top of the web' (Noble.) The eggs are 6 or 7 to 10 in number, creamy white in colour. Average size of 100 eggs, 2·16 × 1·52 in. [54·9 × 38·7 mm.]. Incubation is performed by the duck alone, and lasts 22 to 23 days (Heinroth); 24 to 25 days (Naumann). In Scotland the full clutch may be found occasionally as early as the first week of May, but more usually about the middle of the month, and sometimes even in early June. On the Shetlands Saxby records eggs as early as April 26, but in Northern Russia the eggs are often not laid till the end of June. Only one brood is reared in the season. [F. C. R. J.]

5. Food.—Grasswrack (*Zostera*) and other marine algæ, fresh-water submerged weeds, fine turf, cockles and other Mollusca, and small Crustacea. The young feed mainly on small Crustacea, and accompany the female in their search for food. [W. P. P.]

2. THE SHELDUCK AND SURFACE-FEEDING DUCKS

[W. P. Pycraft]

Systems of classification are apt to be somewhat arbitrary, and rarely reflect the habits of the living animals they embrace. But there are exceptions to every rule, and the division of the Ducks into "surface-feeding" and "diving" species is one of these; for this division, though originally based almost entirely on habits, is confirmed by evidence obtained from diverse sources. One is tempted to regard the surface-feeding species as birds of the fresh waters, and of the diving species as marine types; but a little reflection will show that this is by no means true. It is thus, then, plain that the obvious structural features which distinguish these two groups are not to be attributed to their haunts, but rather to the method of securing their food. Those of the surface water will, it is true, dive under exceptional circumstances, as in the avoidance of enemies, or momentarily when in play; but they are not dependent on diving feats to secure their daily bread. Such food as is obtained lower than the surface of the water is procured by peculiar, semi-diving movements, wherein the fore part of the body is submerged, leaving the hinder portion sticking vertically out of the water, after the fashion of geese and swans. The diving Ducks, on the other hand, have to dive for a living, and hence it is that in them we find the legs relatively shorter, the thigh-bone especially, whereby the carriage of the body when on land becomes semi-erect and somewhat strained. On the water, however, the advantage of this change in the fashion of the limb becomes at once apparent, for it is now obvious, from the more backward position of the legs, increased powers both of diving and swimming are attained. This modification of the leg, however, is purely an adaptive character, and therefore of no value to the systematist. Happily, however, it is confirmed from an unexpected source, and one which excludes all

possibility of having been induced by adaptation. We refer to the lower, or syringeal, end of the windpipe. This, and in the males only, displays a curious, roughly spherical bony chamber, as a rule on one side of the syrinx only. But in each species this bulla has a character of its own, as distinctive as the plumage. Only in the sheldrake is a symmetrically disposed double-bulla present.

What purpose do these curious inflations of the syrinx serve? Apparently they are vocal organs, resonators. If this is so, one would have expected the males to display the more powerful voice, but the opposite is actually the case; only in one or two species do the males seem to utter any very peculiar sound, such as might be attributed to the bulla. It may be, of course, that closer observation will show that the males are more vociferous than was supposed, or that the peculiar notes characteristic of the males of the several species have a greater carrying power than we have hitherto imagined.

When we turn to the "diving Ducks," we find this syringeal bulla assuming still stranger forms. In the Eider-ducks alone does it bear any likeness to that of the surface-feeding species. The Scoters form a group apart, to be considered presently. In the rest this chamber has become enormously enlarged, and its transformation seems to have put a greater strain on the bone secretions concerned with its formation. At any rate, the walls of the chamber are pierced by large vacuities, across which are stretched exceedingly delicate membranes. Here again we must regard the modification as concerned with voice-production and not with the diving habits, since only the males are affected. In the goosander alone does the female show any tracheal modification. This takes the form of a fusiform enlargement of the windpipe itself, and in the male there are two such enlargements, which can be felt by drawing the fingers down the neck of the living bird. The male merganser resembles the female goosander in this respect, while the female merganser displays no such contrivance.

In the Scoters these syringeal bullæ are wanting. In the common

scoter the trachea and syrinx are conspicuous for the absence of modifications, but the bronchi are curiously inflated. The velvet and surf scoters show no syringeal peculiarities, but a curious swelling at the upper end of the trachea, and a second in the furcular region. And the precise function of these, as of the syringeal bullæ, remains to be demonstrated.

The surface-feeding Ducks, including the shelduck, display a further peculiarity in the presence of a conspicuous "speculum" on the wing—an oblong band, generally of metallic green, formed by the secondary remiges; and this is commonly bounded by a bar of white or black, or both, formed by the tips of the major coverts. Often a bar along the hinder edge of this speculum is formed by the tips of the secondaries themselves. But there is no need to enlarge upon this feature, since it will be necessary to constantly refer thereto in describing the plumage of the several species, for each has its own fashion in this particular. Let it suffice here to draw special attention to the gadwall, which in this particular differs from all the other surface-feeding species.

Of the remarkable change of plumage, which annually leaves the male, for a season, in a state of "eclipse," we have already spoken, and the subject will be referred to again in the course of the following pages.

Similarly, no more than bare mention will be made here of the unusually fleshy and horn-fringed tongues, and the curious armature of the jaws. These are adaptive characters, best dealt with in considering those species wherein they are most conspicuously developed.

Though monogamous the males display little or no care for their young, this duty being undertaken by the female. She is an assiduous mother, plucking the down from her own breast for the benefit of her incubating eggs, just as the rabbit denudes itself of under-fur for the sake of its newly born young.

Young ducks, it need hardly be remarked, are nidifugous. But

they are peculiar, in the first place, on account of their coloration, which betrays but little evidence of the earlier striped livery which must have been worn during bygone ages; and in the second, for the infinitely slow development of the wings, wherein they differ conspicuously from the nidifugous young of Gallinaceous birds. In the latter the remiges are developed within a few hours of birth, and long before the appearance of contour feathers. In the Ducks, on the other hand, the quill feathers do not make their appearance until after the rest of the body is fledged, and these differences seem to be intimately associated with the conditions of existence. In the one case a limited power of flight has been prematurely developed, owing to the necessity of finding escape from the numerous enemies which lurk in dry covert; in the other, escape is found by taking to the water, and on this account the development of the contour feathers of the trunk is more important than those of the wings, and this because they afford a better protection than down, being more resistant to water.

3. THE SHELDRAKE

[W. P. Pycraft]

The sheldrake, though not in its habits so much a water surface-feeding Duck as a shore bird, may properly be classed with the surface-feeders by virtue of the structural similarities above mentioned. It is one of the handsomest and most strikingly coloured of the Ducks. It is also one of the most interesting. In the first place, it represents one of the annectant links with the Geese. It also commands attention from the fact that the two sexes are practically alike and brilliantly coloured, while the offspring have a distinct livery, though differing less markedly perhaps from the adult than is the rule in such cases.

While the surface-feeding Ducks for the most part haunt inland

waters, the sheldrake generally avoids them, preferring the open sea, sandy beaches, and estuaries: occasionally, however, it will nest inland, as on lochs in Scotland.[1] In parts of its range, as in Asia east of the Caspian, salt lakes are frequented. The main factor in determining these haunts is of course food. In their freshwater-haunts this seems to consist mainly of small molluscs and aquatic insects obtained from shallow water, and worms obtained from pastures. Small fish, Crustacea, and molluscs form their staple diet by the sea, and much of this food is sought for at low tide below high-water mark.

As with many of its relatives and the Gulls, the sheldrake procures marine-worms by rapidly beating the ground with its feet, which apparently sets up vibrations, which drive the coveted morsels to the surface. St. John, commenting on this fact, implies that dry sand is thus tapped, but from my own observations only pools of water are thus explored. But whatever the meal for the time being, it is never procured by diving or from deep water; at most the body is half-submerged by paddling with the feet, so that the hinder half projects vertically from the water, as in the case of its surface-feeding relatives and the Swans. Under the stress of great fear, however, diving seems to be resorted to, both by young when striving to evade capture and the adults when wounded or to avoid the stoop of the peregrine. The flight of the sheldrake is likened by some to that of the swan, by others to that of the goose, from which it is clear that in this particular it differs conspicuously from that of the more typical ducks. But neither on the wing nor at rest are the bright chesnut colours of this bird visible save at close range; commonly the coloration appears to be simply black and white, disposed in large and sharply defined patches, which, when a number of birds are seen in full career, suggest nothing so much as a flock of large butterflies.

While feeding, the sheldrake is somewhat noisy, and the female

[1] R. B. Sharpe, "British Birds,' *Lloyd's Natural History*, vol. ii. p. 261.

particularly so, as in the case of the mallard. Every now and then she will utter what Mr. Abel Chapman calls "a long-drawn, reverberating bark," and occasionally this is accompanied by half a dozen distinct quacks. The note of the drake is quite different—a peculiar sibilant noise, half-squeak, half-whistle, usually quite low and gentle, but sometimes tuned so as to become sharp and ringing. But what is still more curious about this cry is the fact that at the time it is uttered the beak is closed, apparently tightly; sometimes indeed, Mr Chapman tells us, the bird seems to be feeding at the very moment. The wigeon-drake, on the other hand, opens his beak wide before commencing his "pipe" and closes it during the note.

At the pairing season, according to Seebohm, the male develops a special call, which takes the form of a clear, rapidly repeated whistle or trill; but whether, as is probable, this is accompanied by any peculiar display there seem to be no records to show. Inasmuch as both sexes are coloured alike, we should expect to find a similar display by both sexes.

The sheldrake, as everybody knows, differs from all the other Anatidæ in that it breeds, with rare exceptions (see "Classified Notes"), in a burrow. As a rule rabbit-burrows are selected, and it would seem that occasionally the rightful owners are evicted to provide the desired nursery. At any rate, on one occasion Sir Ralph Payne-Gallwey saw a female haul a young rabbit out of a burrow by its ear.[1] On occasion badger and fox earths are used; as also are natural crevices on rocky coasts. But when ready-made nurseries are not to be had the birds will dig one for themselves, and the work of tunnelling is believed to fall entirely on the female. This must be no mean task, since the brood-chamber may be as much as 12 feet from the entrance of the burrow. One would have imagined that for tunnelling on this scale beak and feet more adapted for the purpose would have been necessary. But the sand-martin and the bee-eater are, if possible, even less suitably equipped.

[1] C. J. Patten, *Aquatic Birds of Great Britain and Ireland*, p. 86.

Sheldrake (right), shelduck and ducklings
By A. W. Seaby

In the North Frisian Islands, according to Yarrell, the natives make artificial burrows and systematically rob the nests until the middle of June, when they allow the birds to begin to sit. In this way each burrow may yield as many as thirty eggs. In robbing the nest care seems to be taken always to leave four or five eggs in the nest, so that the suspicions of the bird are not aroused: for the sheldrake appears to be of a wary disposition, often taking the precaution to fly straight into the entrance of the burrow, so as to leave no tell-tale traces of the whereabouts of its nursery. Generally, however, more or fewer footprints at the entrance to the burrow will be found, though none extend beyond it. Incubation extends over a period of from 28 to 30 days, during which time the male watches near at hand. Some valuable notes, generously placed at my disposal by Mr. G. Cresswell, show that we stand much in need of careful observation on the feeding-habits of the sheldrake during the incubation period, for he remarks of the numerous birds now breeding on the warrens at Wolferton, Norfolk, that "so far as I can observe, the diet of this bird must be entirely different in the nesting season to what it is during the rest of the year A few . . . do visit the salts and creeks occasionally, for a short time; but only for what may be called 'a wash and brush up,' and not for food. When the eggs are set I do not think the birds move from the vicinity of the heath." It may prove that they live on sand-lizards, beetles, and snails, varied with a little grass. As soon as the young are hatched they are taken down to the water by their parents, the male being as assiduous in their care as his mate. According to Naumann, when the young are hatched far from the water they are carried in the beak, but others seem to incline to the view that the nestlings mount on to the back of the parent and maintain their position by seizing hold of the feathers of the back. Commonly, if not always, they go on their own feet. Some interesting facts on this head are embodied in the notes furnished me by Mr. Cresswell, who, writing of the birds breeding on Wolferton heath, remarks that the old birds, in convoying

their young to the sea, have a choice of routes by fields and ditches, yet they commonly choose to pass through the village street of Wolferton, much to the delight of the inhabitants.[1] Having reached the sea, two or three broods seem to combine to form "troops" of from thirty to forty, accompanied by their parents. If approached, the adults display considerable anxiety for the safety of their young, but if hard pressed, Mr. Abel Chapman tells us, they leave them to seek safety by squatting among the stones and tide-wrack on the shore. When older they seem well able to take care of themselves, resorting to diving if pursued, and dispersing themselves in all directions. Not until they are at least two years old are these youngsters sexually mature, by which time they have assumed the adult dress, though this lacks something of the brilliancy of older birds.

4. THE MALLARD

[W. P. Pycraft]

Of all our native ducks the mallard has surely the highest claim to our regard, for it is one of the handsomest members of its tribe, and certainly the most valuable, since it is the parent stock from which our domesticated breeds have been derived, while in a wild state it yields us still a by no means inappreciable portion of our food-supply. Why the mallard alone among the Ducks has proved capable of domestication is a matter which seems beyond our powers of divination, yet the fact remains. But it is significant to note that when they are not molested, mallard display a very trustful disposition. Thus I have seen numbers feeding and disporting themselves in the midday sun, from the bridge which crosses the Tay at Perth, despite the fact that tramways were continually passing overhead, and people were always watching them from the parapet. But no

[1] *In litt.*

one is allowed to shoot them. And similarly Mr. Ussher, in his delightful *Birds of Ireland*, remarks on this same theme: "When my cows go to drink where the ducks are standing, the latter merely move aside, and the presence of the cowherd at most causes them to fly out on the water; but should any one approach with an umbrella, or even with black clothes, they quit the lake."

During the autumn months large numbers of immigrants reach our shores, and these seem for the most part to make the sea their head-quarters, finding much if not most of their food there, but foraging inland at night. Our home-bred birds, on the other hand, seem to remain where they were bred, though resorting to the sea if ice has locked up their usual food-supply.

In its choice of habitat the mallard is not hard to please; for it will find congenial haunts alike on bare Highland lochs in Scotland and the richly stocked waters of a Norfolk Broad at the sea-level. Bogs, ditches, and the seashore besides are drawn upon as the need arises, while after rain the marshes form an irresistible attraction for the sake of worms and slugs, and in the autumn grain gathered from the stubble, and acorns from the hedges, afford a welcome change of diet. During most of the year it is omnivorous. No animal matter contained in the water is despised, nor is any green thing that grows there deemed unpalatable. Much of its food seems to be obtained by passing large quantities of mud and water through the beak, when the solid, edible portions are retained, the rest being rejected by the aid of the horny strainers which depend from the edges of the upper jaw. In the choice of food, doubtless the thick, fleshy tongue plays an important part. That the mallard is largely a night-feeder is due to force of circumstances rather than choice. Where they have an assured security from persecution they feed by day and sleep by night.

The flight is both rapid and powerful, the swish of the wings being plainly audible even at a distance of several yards. When alighting on the water the body is suddenly inclined upwards, the

neck drawn backwards, and the feet thrust forwards so that on reaching the water they plough along its surface for some few feet before coming to rest. Occasionally, apparently when under the spell of pleasurable excitement, mallard will perform aerial evolutions like those of teal, turning and twisting, and plunging downwards, then rising in a great sweep and circling round, and finally descending, one after another, on to the water. But compared with their smaller relatives they are but indifferent performers.

The mallard rarely dives, save when in the "flapper" stage or in extreme danger. On occasion, Mr. J. G. Millais remarks,[1] an adult will pursue a fish under water. When greatly alarmed, as when being fired at from several points, I have seen them suddenly descend to the water and submerge the body till only the head and the highest point of the back are with difficulty discernible; and all the while the body is slowly thrust forward towards the cover of the reeds, by the paddling action of the feet. Usually, when feeding afloat, the forepart of the body is submerged, so that the hinder half points directly skywards, this position being maintained by action of the feet; and when in very shallow water they will execute a kind of dance on the mud, evidently for the purpose of stirring up worms and other organisms. Gulls and plovers practise a similar device.

The most interesting period in the life-history of the mallard, as with nearly all birds, is the reproductive period. And on this aspect some valuable information has been gleaned by Mr. J. G. Millais and Mr. Hugh Wormald. Mr. Millais' observations show that at times the ardour of the male flags, and on such occasions the female makes advances. Sometimes even as many as three females will court the same male, swimming alongside and round and round him, uttering the while a curious guttural sound, and dipping their bills in quick succession from left to right. Commonly, he carries his head high, as if unaware of these blandishments. Then one or other lowers herself in the water till half submerged, when pairing almost invariably takes

[1] *The Natural History of the British Surface-Feeding Ducks*, p. 3.

Mallard: two drakes pursuing a duck
By A. W. Seaby

place. The display of the male, however, is of a much more elaborate description, at its best exhibiting no less than five distinct postures. As many as four or five rival males often take part in such performances, and act in unison. In the opening movements all swim round the female with the head drawn down close to the body, and in an apparently unconcerned fashion. Then they will suddenly lower their heads till the tips of the beaks are under water, and with this the body is suddenly raised up into a standing posture, and maintained for a moment thus by the treading action of the feet, while the beak, with a jerk, is withdrawn from the water and up the breast, a jet of water being thrown forward as the beak leaves it. These curious movements are commonly accompanied by a low whistle. The normal swimming attitude is now momentarily assumed, but quickly the hinder part of the body is raised and the tail spread, while the neck is held somewhat stiffly and extended upwards. Almost immediately after follows the final phase, when the tail is lowered and the head and neck are stretched straight out along, and touching, the water. This exact sequence, however, is not always observed, but the final stretching out of the head and neck seems always to follow immediately after pairing.

Both Mr. Wormald and Mr. Millais are agreed that adult mallards will commence "displaying" in October, so soon as the new supernuptial dress is completed. And Mr. Wormald has even seen them displaying when in eclipse plumage! Immature drakes begin to display also in the autumn, but such performances lack the vigour of the spring displays.

While Mr. Millais seems to have been the first to draw attention to the display of the mallard duck, Mr. J. L. Bonhote is apparently the first to contend that the she actually chooses her mate.[1] His observations, however, on this head, were made on captive specimens; though they may well be true in the case of wild birds, at any rate occasionally. Mr. H. Eliot Howard showed, long since, in the case of

[1] *Avicultural Magazine*, 1911, p. 300.

the Warblers, that our conceptions of the part played by sexual selection must be modified. Mr. Bonhote's observations on the mallard, if borne out in the case of wild birds, will tend to show that the display serves primarily to express the desire for pairing.

Both sexes seem to take part in the choice of a nesting-site, which varies much. As soon as she begins to sit the female plucks down from her breast wherewith to cover her eggs during her brief absences, thereby keeping them warm and concealing them from prowling enemies. But Mr. Millais asserts that little or no down is used when the nests are made near water; he also remarks that when sitting she places leaves and sticks on her back to still further mask her most wonderfully protective coloration. She is a most devoted mother, save at dawn and dusk never leaving her eggs.

The male takes no part in the task of brooding the eggs, but he remains near the sitting hen, at any rate during the greater part of her onerous task. But by degrees his visits become less frequent, and finally he goes away with other males, and holds aloof from his mate till the autumn.

The young take to the water as soon as hatched, and here they display extraordinary skill and agility in catching flies and other insects. They are jealously guarded by the female, who is a somewhat stern parent. On occasion she will elect to nest in a pollard willow, or even amid the branches of oak and elm, using as a foundation for her nursery the deserted nest of a crow or hawk. When the young hatch out the mother secures their descent not by transporting them but by inducing them to jump from the nest to the ground, a feat which is invariably accomplished without injury, owing probably to the lightness of the body and the length and elasticity of the down. While in health, at any rate, every care is taken to assure their welfare. Gulls are vigorously buffeted, and the fond mother will even challenge and defeat the hawk. From the inclemency of the weather she protects them with her own body, protecting them from rain by spreading her wings over them, and from cold by drawing them under

her closed wings. Such as fall sick, however, she promptly dispatches, though what may be the motive for such summary proceedings is not clear.

5. THE GADWALL

[W. P. Pycraft]

The gadwall stands conspicuous among the surface-feeding ducks for the almost quaker-like sobriety of the coloration of the drake, and still more for the striking character of the speculum, which differs from that of all its congeners, consisting as it does of sharply contrasted patches of black and white, instead of some shade of metallic green or bronze. If coloration alone is a sufficient basis for classification, then those systematists who in time past set the gadwall apart in a genus by itself were justified. But conclusions based upon coloration are insufficient. The systematic position of the gadwall, and indeed of all the other Ducks, has to be determined by a study of far more deep-seated characters, and this study has yet to be undertaken. Meanwhile, no classification can be regarded as satisfactory. But this by the way.

In its habits the gadwall resembles the mallard, but shows a decided preference for quiet, reed-fringed lakes, and sluggish streams where there is plenty of cover; for it is one of the most wary and timid of the Ducks, and hence has become largely a nocturnal feeder. It is perhaps on account of its suspicious nature that it affects country near the coast rather than districts far inland, and for the reason that should its safety seem to be endangered, it can retreat to the open sea. Even in winter it will seek such a refuge, contriving to secure relief from the buffeting of the waves during stormy weather by sheltering in the lee of rocky promontories. While feeding, the female keeps up an incessant chattering: when on the wing the

male utters an occasional and curious croak, not unlike the cry of the raven. They float high on the water when swimming, and procure such food as they need from beneath the surface of the water by that curious half-dive so characteristic of the surface-feeding ducks.

Of its courting habits almost the only records are those of Mr. J. G. Millais, who tells us that the drake swims about all day uttering a most unducklike croak, and "showing off" in a modest way before his prospective mate. But in all his actions at this time he displays a somewhat phlegmatic and self-possessed disposition. At times several males will pay advances to the same female, but there is no squabbling, no animosity or jealousy displayed. At most they swim round and round her, merely raising the feathers of the neck and crown, which, it will be remarked, are somewhat soberly coloured: occasionally one will quickly jerk its beak, mallard fashion, and raise its tail after the fashion of the pintail; but there is no apparent enthusiasm.

Having regard to his behaviour during the period of courtship, one is not surprised to find he displays no interest in the welfare of his offspring, the female being left to brood the eggs and rear the young as best she may. She is apparently not the most discreet of mothers, for she will often elect to build her nest in a wood, and numbers of sitting birds, on this account, are snapped up by foxes.

While the duck is sitting, the drake is undergoing his annual "eclipse" moult, which, by the way, he often begins to assume very early, so that he is in full eclipse dress even before the end of May. Not until the young are fledged does the female start her autumn moult.

As touching the eclipse dress, nothing need here be said, for it has been sufficiently described in the introductory notes.

Teal (right) and gadwalls (left)
By A. W. Seaby

6. THE SHOVELER

[W. P. Pycraft]

Among the surface-feeding ducks the shoveler must always hold a conspicuous place, not only because of the beauty of the drake's plumage, but also on account of the remarkable form of the beak, which, as an ornithological object-lesson in evolution, is worthy of more attention than it has yet received. In all the Anatidæ, as everybody knows, the tongue is thick and fleshy, and provided with a more or less extensive lateral armature of spines, while the inner edges of the beak are beset with horny outgrowths. In the Geese and Swans, and in the fish-eating Ducks, these take the form of serrations of considerable size, but in the surface-feeding Ducks they assume a more or less bristle-like character; and in the shoveler these bristles attain their maximum length, which is considerable, so that they form a sifting apparatus, recalling the baleen of whales. Among birds only the petrels of the genus *Prion* show a similar development of bristles, and herein we have a most excellent illustration of convergent evolution. So far so good. But why in the shoveler alone among its kind have these lamellæ attained so great a length? The answer which would usually be given begs the question, since it would be to the effect that they must be of importance to the bird's well-being or they would not be there. That they are evidence of a high specialisation, enabling the bird to take advantage of a source of food-supply inaccessible to its neighbours, and thereby their possessor gains an advantage in the struggle for existence. This may indeed be true. But so far as the evidence goes, such an answer is lacking in cogency. And this because, so far as the records of the food and habits of this bird go, they do not show that the shoveler differs materially in his choice of food from the

various other species with which he commonly consorts. To justify the generally accepted view, the shoveler should feed mainly on minute Crustacea—water-fleas, cyclops, cypris, and the larger Gammarus, and so on. But though large quantities of these small Crustacea may indeed be eaten, no evidence of this fact has so far been brought to light. On the contrary, all who have ventured to describe the menu of the shoveler have enumerated items which are just as eagerly sought, and as successfully caught, by other species not so elaborately lamellated. One author, Seebohm, it is true, says that the shoveler sifts a larger quantity of mud in a given time than any other duck—and we may assume he earns more for his pains—but this is not enough. So far as the evidence goes, the shoveler would get on just as well with a much less perfectly developed sifting mechanism, and in just so far we seem to be justified in regarding these lamellæ as affording another of the many instances of "hypertely" which have of late years been brought together. That is to say, these lamellæ have developed beyond what is needed to attain their end. Here, then, is a point well worth the while of the field ornithologist to take up. The sequel may prove that the generally accepted views on this theme are correct; but until the matter has been made the subject of special inquiry, the need for this very elaborate sifting apparatus must remain open to question.

Having regard to the peculiarities of the beak, it is certainly significant to find that the shoveler in its choice of haunts is a strictly fresh-water bird. It resorts to the sea only when driven by the severest weather; and it shows a marked preference for bog and reedy marsh-land affording open patches of water, or the backwaters of rivers where there is plenty of cover in the shape of reeds and similar water-plants. This choice is also determined by its small feet, which are ill-adapted to stemming the current of tidal water. Secure in these fastnesses, it seems to spend much of the day in sleep, rousing into activity with the twilight and feeding eagerly till dawn. Night, however, is not the only feeding time, for the shoveler is particularly

fond of aquatic insects of all kinds, catching such as fly with wonderful dexterity. But it is no less skilful in the capture of aquatic insects such as are obliged to come frequently to the surface for air. Millais describes the zeal which is displayed in taking the latter, and the keenness of sight which is necessary for success. A bird which he kept under observation during one of these insect forays manifested the greatest excitement. The victim was detected long before it reached the surface, and was seized the moment the ascent was completed by a headlong rush along the water. Having effected a capture, it would return to its resting-place and watch for more, restlessly working its neck backwards and forwards as if preparing for its next sally. Occasionally it would grow furiously excited, turning its head swiftly now this way and now that, as if it saw beetles—if such they were—in every direction. At other times it will feed from the bottom of the stream after the manner of its tribe, by a semi-dive, the body being half-submerged till only the hinder half remains visible, the tail pointing directly skywards. On the wing it must be described as active and powerful, rising almost perpendicularly into the air like a teal; and with a rattling of the wings sufficiently loud to have earned the name of "rattle-wings." Like the teal it is fond of taking "headers" towards the water and sweeping upward again; but when fairly launched on the wing its flight recalls that of the wigeon.

Having regard to current theories on the significance of resplendent coloration among birds, it is something of a surprise to find that the courtship of the shoveler is a very tame affair; on neither side, indeed, is there any marked demonstrativeness. The drake, it seems, swims up to the female uttering a low, guttural croak—"*konk, konk*"—and elevating his head and neck, and jerking his bill upwards. She bows in recognition of the greeting, then both swim round in circles, one behind the other, meanwhile passing water rapidly through their beaks. At other times he indulges in aerial flights. Indeed, Mr. Millais remarks that during the courting season they spend more time in the air than any of the other ducks, beating up

and down over the marsh, the male chasing the female in evidently playful mood, and during such excursions they display amazing skill in turning and diving through space.

Polyandry seems occasionally to take place, and when this is so the additional male is generally immature. As a rule, among the ducks the care of the young is left entirely to the female, but the male shoveler will sometimes display some anxiety on their behalf if he deems them to be in danger, by flying round and round uttering a curious call, something between a croak and a quack. According to Lydekker,[1] at least one instance is known wherein the drake "to some extent" took part in the incubation of the eggs; but, as he remarks, if there has been no mistake in this matter, it is hardly likely to be a solitary example. It is to be hoped that some effort, then, will be made to confirm or contradict this statement, after careful observation.

7. THE PINTAIL

[W. P. Pycraft]

Among the many attributes of the pintail, beauty, both of form and coloration, occupies a conspicuous place, at any rate so far as the male is concerned, though this is not of such a transcending character as to overshadow the striking personalities of its congeners the mallard, shoveler, teal, wigeon, and garganey, which are all, each in its own way, beautiful. But in some ways the pintail is more interesting than any of these; and this because it seems to have preserved more links with the past in the matter of plumage changes than any of the others. We hold to this view on account of the plumage changes revealed by a study of the eclipse dress of the male

[1] *The Sportsman's Book of British Birds*, p. 320.

Shovelers (upper pair) and garganeys

By A. W. Seaby

on the one hand, and of the juvenile dress on the other. Briefly, in the latter the back is of a dusky hue, marked by short, rather broad, transverse bars of buffish white, and the speculum, devoid of any gloss whatsoever, presents an indescribable blending of brown and grey. In immature birds, at the stage when the coloration has already proclaimed the sex of the wearer, we find similar barrings, associated with strongly marked striations all over the under surface of the body. Later, these bars are retained only by the male in eclipse, but they are then somewhat changed in character, being wavy in outline, and associated with curiously obscure vermiculations recalling those of the supernuptial dress. The female loses all traces of this on attaining maturity, broad V-shaped loops of buff taking the place of bars; whereby we may infer that the eclipse plumage of the male answers to an older, more ancestral, livery than that of the female, which has travelled from this stage along a line of its own. But let it not be supposed that we know all that is to be discovered of the eclipse plumages of this, or of any others of our ducks. On the contrary, though much has been written on this subject, we are as yet far from being able to recount the full sequence of events in their correct time and place. It would not, indeed, be easy to find a theme in ornithological literature which has been more completely obscured by discussion, and if we are ever to possess ourselves of the facts as to what does take place, the whole matter must be taken in hand afresh.

In its choice of haunts, as in its choice of food, the pintail has much in common with the wigeon, for while both are to be found on large inland lakes, they seem to prefer rather such areas of fresh water as are within easy reach of the sea, whither they can escape for safety when alarmed, and where they find a safe harbourage when the perils of foraging for food have been successfully braved. Large estuaries perhaps furnish their ideal haunts in these islands, not that they find here any greater plenty of food than elsewhere, but because of the greater security which they afford, for the pintail is

a peculiarly wary and timorous bird, and wherever a large flock may be feeding, one or other is constantly on the lookout against surprise. Hence, like other and less suspicious members of this tribe, they feed at night rather than by day. When they have acquired a certain amount of confidence, however, they do feed by day, and at such times search with zeal for aquatic insects of all kinds, most of which are taken from the water, but some are caught when on the wing with great dexterity. Small Crustacea and small molluscs are also greedily devoured, but for the most part they seem to feed on water-plants. Such as grow in shallow water are uprooted and eaten as they float at the surface, and to secure these the body is half-submerged, so that the hinder half of the body projects vertically from the water. But they rarely or never dive. When swimming they float high in the water, and commonly with the tail much raised, though never so much so as in the long-tailed duck. By day they are remarkably silent birds, the male, at no time vociferous, when flying will occasionally utter a low whistle, and when frightened or wounded a sharp "cheeping" note like that of a wigeon. The female, especially at night, gives tongue to a low quack. During courtship both sexes become rather more loquacious, and then only does the male emit a curious double note identical with that of the teal under the stress of like emotions.

Of this courtship but little seems to be known, and most of what has been recorded has been observed by Mr. J. G. Millais, from whom we gather that the male in display presents actions recalling in some respects those of the mallard, and in others of the wigeon. Thus a number of males will often be making advances to the same female, and suddenly all will start up and raise the tail. At other times all will stand up in the water, and bringing the bill down on to the breast will then swiftly jerk it upwards, mallard fashion, at the same time uttering a low soft note. According to Naumann, the male often swims round his prospective mate uttering a deep clük, which, if the observer be fortunate enough to be sufficiently near,

Wigeon (lower). Pintails courting (upper four)

By A. W. Seaby

he will find is preceded by a sound like the drawing in of the breath followed by a low grating note. It seems plain, however, that only a general insight into this aspect of the life-history has been obtained, and we must await further observations before we are in possession of all the facts.

Save that the male seems to assist the female in the choice of a nesting-site, we have no records as to the share, if any, which he takes in the care of his offspring: and we must assume that, after the fashion of his kind, he leaves this entirely to the female.

8. THE TEAL

[W. P. Pycraft]

The teal is at once the smallest British duck, and, after the mallard, the most numerous breeding species in the British Islands. It is thus generally regarded as a resident species. But in the autumn, while hosts of teal arrive on our shores from Northern Europe others are leaving us. These last are our own home-bred birds, and it is a moot point whether any of these pass the winter in the land of their birth: possibly a few remain. If, however, as we surmise, all depart as their places become filled by immigrants, then the teal is a resident species only in the sense that it is always to be met with among us, at one time home-bred birds and at another strangers from afar representing the race.

These home-bred birds distribute themselves along our eastern and northern counties, a few pushing still farther inland; but all confine themselves to fresh waters. On the other hand, the autumn immigrants, for some time after their arrival at any rate, haunt the sea and estuaries, drawing gradually inland as newcomers arrive. Here they remain till the spring, unless driven back to the sea by prolonged frost. But this is a refuge which is sought only in dire

need: after frost the only other factor powerful enough to drive them from fresh water is persecution at the hands of sportsmen. When they are constantly harassed by day, such as live within reach of the sea repair thither daily at dawn, returning at night to their chosen haunts to feed. As with the species already considered, it would seem that these nocturnal meals are partaken of rather from necessity than choice: persecution at the hands of man driving them to seek the cover of the darkness as a means of security against surprise, which is the more easy when the attention is distracted by the search for meat. This, however, is by no means clearly established. It is quite possible that, at any rate during certain times of the year, they may feed by choice at night. For it must be remembered that much of the food of the surface-feeding ducks is of an intangible character, invisible to the birds themselves, consisting as it does of microscopic animal and vegetable organisms, many of which may be of the kind known as negatively heliotropic, that is to say, shunning the daylight—as a certain personage is said to avoid apple-dumplings—and therefore obtainable only during the hours of darkness. These highly nutritive but invisible bodies are obtained, as everybody knows, only by passing large quantities of water rapidly through the mouth by the process known among fen-men as "bibbling." The solid particles are lodged on the fleshy, sensitive tongue, and the water is strained off by the fringes along its sides and the lamellæ bordering the beak. And such "small deer" can be captured as well by night as by day. More observations are needed on this subject, and it may prove that persecution is only partly responsible for these nocturnal habits.

By day teal will rest for hours motionless, in pensive mood, or asleep with the head tucked away amid the scapulars; but if surprised they take flight with amazing suddenness, shooting straight up into the air without preliminary warning, as from a steel spring. They are no less remarkable for the skill and speed with which they change the direction of their flight, even when in full career, for they can turn and twist with the ease of a flock of dunlins, and often, when

apparently pursuing a course which is to end only at some far distant rendezvous, they will suddenly plunge downward and settle on the water.

Teal are said to be wonderfully good weather prophets. When, by severe and prolonged frosts they have been compelled to seek their living from the sea, they will, even when there is no sign of abatement in the rigour of the weather perceptible to human senses, betake themselves back again to their inland haunts, and then, standing on the ice, await the dissolution which they seem to have divined will overtake it within twenty-four hours of their vigil. They leave their inland haunts at such times with evident reluctance; hope with them dominates experience. As an instance in point we may cite the winter of 1891, which was one of exceptional severity, driving hordes of wild-fowl to seek sustenance with us. Vast flocks sought shelter in Ireland, and huge numbers found food long after other sources had closed to them on the decoy lake at Kerryville, Queen's Co. But at last this too became an ice-sheet, and for days its surface, for about five or six acres, was as thick with teal as they could sit, it being estimated that between six or seven thousand birds here awaited the much-desired thaw.

Our home-bred birds are not hard to please in their choice of haunts, and they breed wherever a sufficient supply of food seems assured to them. Quiet, shallow lakes, whose shores are overgrown with rank herbage, are favoured areas; but marshes near the coast, as well as inland bogs, are readily adopted. Heather-covered wastes with rushy pools have a great fascination for them.

In the matter of their courtship teal display considerable vivacity. But it is significant to note that while there may be many females in the vicinity, only one perhaps will permit the advances of the opposite sex; and she commonly receives court from several drakes at once, which seems to show that the whole phenomena of courtship are dependent upon some subtle state of sexual "ripeness" so to speak, wherein the condition of the female plays a more important part than

is generally supposed. We are indebted for practically all that we know on the behaviour of teal during courtship to Mr. J. G. Millais. Several males will vie one with another in friendly rivalry for the possession of the particular female which has given signs of willingness to mate, should a suitable suitor present himself. The antics of these amorous males are somewhat extravagant. As if according to some traditional usage, they stand, momentarily, erect in the water, raising the tail, arching the neck, and drawing the beak rapidly up the breast, mallard fashion: every now and then one or other will give forth a low double whistle. During these movements the female will sometimes allow two drakes to approach her closely, all the others disposing themselves in a circle or semicircle near at hand. But should any male approach who has received no sign of favour, she promptly drives him off. After some days of this flirtation the female at last goes off with one or other of her suitors to some nesting-place near at hand, but once pairing has taken place a strict monogamy is observed.

The male teal seems to display more anxiety for the welfare of his mate and young than, say, the wigeon, and in this respect again he resembles the mallard. At any rate, when these birds have been discovered breeding, the male has often exhibited as much concern for the downy young as his mate, inviting the pursuit of the intruder by a feigned lameness. The young at the same time scatter, and evade detection by lying close to the ground. At times the female shows a quite remarkable courage in the defence of her brood. A case in point is furnished by the well-known story quoted by Yarrell,[1] wherein a brood of downy nestlings, found by a boy on Lord Cavan's estate in Achill, was driven towards the farmhouse followed by the distracted mother. The boy drove them into the yard and into a shed, and still she followed and was shut in with them. How great an ordeal was this may be gathered from the fact that both dogs and people had to be encountered during the whole of the latter part of

[1] *British Birds*, vol. iv. p. 389.

the journey. But probably, in her anxiety for her young, she had eyes for nothing else.

Not even when courting is the male teal vociferous: when on the wing he will occasionally utter a low double whistle. The duck quacks like the mallard female, but lower, more hurriedly, and less defined, while the male occasionally gives forth a sibilant note or two, like that of the mallard drake. But young teal, when in packs in the autumn, are said to keep a constant low clucking chatter.

9. THE GARGANEY

[W. P. Pycraft]

In spite of the handsome livery of the male, the garganey has somehow failed to attract the attention which it deserves, for it is a species which affords profitable themes for discussion in more than one direction, even though, as in regard to details of its coloration, one can scarcely hope to find solutions for the queries that suggest themselves. What, for example, can be the meaning of the curious coloration of the under tail-coverts? In all the other surface-feeding ducks discussed in these pages, these feathers, in the male, in his "nuptial" dress are black, with a more or less metallic sheen. In the garganey alone they are coloured after the fashion affected by the females of the race, or of the males in eclipse. Again, why is it that though it enjoys a wide distribution, it is nowhere met with in such abundance as, for example, are mallard and wigeon. Perchance this numerical inferiority is due to its inability to stand cold, for its northern range falls far short of that of the mallard and wigeon. It is also the least edible, or rather the least esteemed for table, of all the surface-feeding species, and this apparently because it feeds more largely, as we shall show, on animal food than any of the others.

In its habits the garganey resembles both the teal and the shoveler, and, like the latter, it loves to gutter in boggy swamps and backwaters. But while the shoveler apparently consumes large quantities of water-fleas and other minute floating Crustacea, as well as other microscopic types of animal and vegetable organisms, the garganey seems to prey rather on insects and their larvæ, worms, small frogs and their spawn, small fish, and molluscs. True, the shoveler also eats these, but in smaller quantities. In other words, the garganey is less a vegetarian apparently than his congeners, but it is certain that the terminal shoots of water-plants are eaten. That this is so is shown rather by the taste of its flesh, which by common consent is rank, than by actual observation, for the records of its food given by various authors vary so much that we may take it for granted much of what has been stated on this head is pure guess-work. That an animal diet invariably imparts a disagreeable flavour to the flesh of ducks is shown by the fact that the wigeon of the north-west of Scotland, which perforce live largely on cockles, are uneatable, while birds killed elsewhere afford the best of all table birds. Similarly, the eider, which is almost entirely a "meat" eater, is anything but palatable, but kept in confinement and fed on barley and wheat, it quickly becomes transformed into one of the most delectable of ducks!

In its flight the garganey resembles the shoveler, but is far swifter, and peculiarly noiseless on the wing. It cannot, however, compare with the teal for agility in effecting sudden turns, or in rising from the water. When swimming it floats high, but it does not appear to dive, save after the fashion common to the surface-feeding ducks and swans, that is to say, by submerging the forepart of the body till the long axis of the body is at right angles with the water.

It courts like the shoveler. Mr. J. G. Millais, who has closely studied its habits at this time, tells us that the drake swims closely round his prospective mate, spreading his long scapulars and ruffling

the head feathers, thereby displaying his splendid plumage to the very best advantage. This display is varied by a kind of follow-my-leader game, the two coursing round and round, head and stern, and forcing large quantities of water through their beaks, which are buried to the level of the nostrils.

During this amorous period the drake utters a very peculiar cry —a strange crackling note which may be likened to the noise of a high-pitched rattle, or to a stick being swiftly drawn across iron railings. Hence in East Anglia, in addition to its name of "summer teal," it is also called the "cricket teal."

The care of the young, as usual, falls entirely on the female, and there are no records of instances affording exceptions to this rule, such as have been remarked in the case of other species.

In regard to the reproductive period, it is interesting to note that the young garganey takes longer to attain sexual maturity than is the case with teal, which not infrequently will breed at ten months old; with garganey this is rarely the case.

Finally, it is to be remarked, the garganey retains its eclipse dress longer than any other surface-feeding duck. According to Mr. J. G. Millais, the "breeding" dress is not complete till December, and may even be protracted till February. In this matter, however, it again affords an approximation to the shoveler, wherein also the eclipse dress is longer, though it is never so long retained as in the case of the garganey. Somehow one would rather have expected to find this prolonged existence of the eclipse dress in the gadwall, but in any case it affords another illustration of the contention that this dress answers to the "winter plumage" of the Limicoline birds.

10. THE WIGEON

[W. P. Pycraft]

That the wigeon and the mallard in their choice of habit display much in common is convincingly attested by the fact that the two are so commonly taken together in decoys. Nevertheless they display a marked preference for estuaries, where, if the conditions be favourable, they swarm during the winter months, the period of their sojourn with us, for the few pairs that remain to breed are a negligible quantity. And this fascination of the sea is felt also, as we have already remarked, by the mallard which come south to us for the winter. Nevertheless, considerable numbers work their way inland in the case of both species; though, for the most part, they do not travel beyond easy reach of the sea.

During its sojourn here the favourite and principal food of the wigeon is furnished by *Zostera marina.* To obtain this they await low water, when, by that peculiar half-diving movement peculiar to the Anatidæ, they contrive to pull it up for the sake of its succulent roots. Brent geese feed largely on this weed, and from their larger size and longer necks they are able to obtain all they need in deeper water than the wigeon can forage in. As a consequence, at any rate when hungry, wigeon will play the jackal, and wait on the geese for the sake of the stranded leaves which they reject. Similarly, when fishing in fresh water, they will watch the coot reappearing with weeds after his dive, rushing up at the moment the diver comes to the surface to deprive him of his spoils! In the spring the wigeon is as fond of cropping the grass as a goose, and eats large quantities thereof. But later a change of diet is made, animal food in the shape of aquatic insects of all sorts, small Mollusca, and Crustacea being eagerly sought for. There are times, indeed, when at sea that the favourite *Zostera* is hard to come by, and then they will greedily eat cockles and other shell-fish, and such other animal food as comes in

their way; but after such a diet the flesh is poor. But as a table-fowl wigeon are disappointing, save when they have been feeding for a time in fresh water, when they are scarcely if at all inferior to mallard and teal.

That the wigeon for choice prefers salt water is shown by the fact that among the surface-feeding species they are the most numerous on our coasts. Sir Ralph Payne Gallwey remarks on this head that out of 1500 duck and geese he once killed off the west coast of Ireland, 1200 were wigeon; and again, out of a bag of 500 duck obtained in ten days in the winter of 1883, 400 were of this species. And by way of confirming this estimate, he points out that of 90,000 duck taken during a period of thirty-five years from the celebrated Ashly decoy in Lincolnshire, only 2000 were wigeon. These decoys in the past—and many are unhappily still at work—have wrought an appalling total of destruction, as may be gathered from records of the celebrated Steeple decoy in Canny Marsh, Essex. In the twelve years between 1714-1726, no less than 44,677 wigeon were taken, the "best" year being that of 1714, when 6296 wigeon were taken, 347 teal, 675 mallard, and 46 pintail! And here it is interesting to note that a couple of hundred years ago the great hauls were made in the early autumn, not during January, February, and March as now.

Some idea of the vast numbers which in times past, at any rate, used to resort to the Irish bays and estuaries during the winter months may be gathered from Sir Ralph Payne Gallwey's *Fowler in Ireland*, pp. 36-48, where he describes how they sit in dense companies, and when they take flight they move in dark sweeping clouds, with a roar of wings as they rise, or pitch, which may be heard a mile off.

So far as the evidence goes, it would seem to show that the wigeon, like its congeners, by choice feeds by day, but after a little persecution it speedily changes its habits, and feeds only during the hours of darkness.

Of its courting habits we have but few records, and these we owe for the most part to the enthusiasm of Mr. J. G. Millais. The display of the drake, he tells us, differs somewhat from that of other surface feeders. Five or six drakes will persistently swim round a female and persecute her with their attentions. Every male raises his crest and stretches out his neck close over the water, meanwhile erecting his beautiful elongated inner scapulars as if to display them to the best advantage; and at the same time the wrist is thrust downwards, causing the primaries to rise in the air. During all this time they keep up a babble of loud "*whee-ous*," for the wigeon is by far the noisiest of the ducks in his courtship. Only occasionally do the males fight, and in such encounters each tries to seize the other by the back of the neck, and to get his adversary underneath him, when he may be punished by a sound drubbing with the wings as well as severe bites on the head and neck. As a rule such contests are fought only by old males, but occasionally, at any rate, like the shoveler, immature birds enter the arena, and it is certain that such occasionally breed.

So soon as the female begins to sit, the male, Mr. Millais tells us, betakes himself off, to undergo, in seclusion, the moult which for a season deprives him of his fine feathers and leaves him in the more sombre garb of his ancestors. These weeks of humiliation he spends in mutual companionship with all the other males in the neighbourhood in like case. But, according to Naumann, the male attends the female while sitting till incubation is about half over, roosting by day near the nest, and accompanying her each evening to the feeding ground. But at last he leaves her to fend for herself, while he retires to moult.

Photo by J. C. Crowley

Greylag-goose on nest in heather (Scotland)

Photo by J. C. Crowley

Young greylag geese in nest

11. THE GEESE

PRELIMINARY CLASSIFIED NOTES

[F. C. R. JOURDAIN. W. P. PYCRAFT. A. L. THOMSON]

GREYLAG-GOOSE [*Ánser ánser* (Linnæus); *Ánser cinéreus* Meyer. Grey-goose (generic). French, *oie cendré*; German, *Grau-Gans*; Italian, *oca selvatica*].

1. Description.—The greylag-goose is to be distinguished by the white nail of the beak, which else is flesh-coloured, the flesh-coloured legs, and the light ash-grey of the lesser wing-coverts. The sexes are alike. (Pl. XXVI.) Length 34 in. [863·0 mm.]. The upper parts are of a light greyish brown, paler tips to the scapular and interscapular feathers, giving the back an irregularly barred appearance. The major coverts and secondaries have narrow white edges. At the base of the beak a narrow white bar is often present; the upper and under tail-coverts are white. The breast is of a light greyish brown obscurely barred with dusky bands. Immature birds are somewhat darker than the adults, and lack the bars on the abdomen. The young in down are of an olive-brown colour above, tinged on the forehead, sides of the head, hind-neck, fore-breast, and flanks with greenish yellow. The rest of the under parts yellowish white. Beak and feet flesh-coloured. [W. P. P.]

2. Distribution.—In the British Isles the greylag is now confined to Scotland, although a colony of semi-domesticated birds exists at Castle Coole in Ireland, and formerly it bred in some numbers in the eastern counties of England, surviving till the early part of the nineteenth century in Lincolnshire. In Scotland it breeds in Ross, Caithness, and Sutherland, and of late years has shown a tendency to increase its range. It also nests in some of the Inner Hebrides, and in some

numbers in the Outer Hebrides, while in 1904 a pair is said to have bred in the Orkneys. Outside the British Isles it nests in Iceland, but has ceased to do so in the Færoes, while a few pairs may still survive in Friesland and Denmark, and it is found locally in North Germany. The records of breeding in South Spain are only due to pricked birds, but it is found in the Danube valley, and is common in the Dobrogea, and in Russia ranges south to the Volga, the Caucasus, Transcaucasia, and the Kirghiz Steppes, but is not found north of 59° in the Perm government, although common on the coasts of Finland and ranging north to the Varanger Fjord, as well as in Scandinavia up to the North Cape. In Asia it ranges across the continent, south to Transcaspia, North Persia, Yarkand, and Mongolia, and east to Ussuria and Kamtschatka, but is not found northward of the Arctic Circle. The winter movements extend south to the Mediterranean and North-West Africa, Central India and China, and it has occurred as a casual on the Azores and Madeira. [F. C. R. J.]

3. Migration.—A resident in small numbers, but rather more abundant as a winter visitor and bird of passage from the north, arriving exceptionally as early as 21st August, but more usually between 24th September and 13th November, and leaving at the end of April or the beginning of May (cf. Clarke, *Studies in Bird Migration*, 1912, vol. i. p. 159). As a truly wild bird its only British breeding-places are in the Hebrides and the North-west Highlands, while in winter it is uncommon on most parts of the British coasts, although numerous in a few localities. It is said to be visiting the Solway in increasing numbers, and it is also partial to some districts of East Leinster and to the lower Shannon. But most of the birds seem to pass on to more southerly winter quarters. (Cf. Ussher and Warren, *B. of Ireland*, 1900, p. 174; Patten, *Aquatic Birds*, 1906, p. 55; and Gladstone, *B. of Dumfries.*, 1910, p. 239.) Gregarious. [A. L. T.]

4. Nest and Eggs.—The usual site for the nest in Scotland is among deep heather, often on islands, sometimes sheltered by a boulder, less commonly in coarse grass or rushes. Exceptionally it has been known to breed on a ledge in the face of a cliff. On the Continent it has been known to breed in an old heron's nest in Hanover, while in the delta of the Danube a floating nest like that of a grebe is built of fragments of reeds and other vegetable matter. Sometimes very little material is used, and the nest is little more than a scrape, lined with down from the goose, but other nests are comparatively bulky, and consist of tufts of dead grass, bits of heather, moss, etc., mixed with down. (Pl. xxv.) The eggs are generally 4 to 6 in number, less often only 3, or even 7 or 8. The supposed instance of 12

was probably due to two geese laying in one nest. When fresh laid they are a dull yellowish white, but soon become stained by the sitting bird. Incubation is performed by the female alone, and lasts 28 days. Average size of 111 eggs, 3·43 × 2·3 in. [87·1 × 58·5 mm.]. The eggs are generally laid in Scotland by the middle of April, occasionally not till the end of the month, and only a single brood is reared in the season. In Northern Europe fresh eggs may be found as late as the end of May or even early in June. [F. C. R. J.]

5. Food.—Corn in cultivated districts, grass, and roots, and the tender shoots of water-plants. The young feed on bog-nuts and various water-plants, as well as on aquatic insects, and are accompanied by both parents. [W. P. P.]

WHITEFRONTED-GOOSE [*Ánser álbifrons* (Scopoli). Grey-goose (generic), laughing goose (Devon). French, *oie rieuse*; German, *Blässen-Gans*; Italian, *oca lombardella*].

1. Description.—In the whitefronted-goose the beak is of a pale rose-pink colour, and the nail white; a more or less conspicuous patch of orange-yellow occurs on the culmen, between the nares, and on the sides of the lower jaw, and the legs are orange-yellow. (Pl. XXVI.) Length 27 in. [685·0 mm.]. A broad band of white, bordered behind with black, surrounds the base of the beak. The upper parts are of a dark greyish brown, paler on the crown and cheeks, while the scapular, interscapular, wing-coverts, and flank feathers are tipped with greyish white, and the secondaries edged with greyish white. The upper tail-coverts are white. The fore-breast is pale ash-grey, the breast white with irregular bars or patches of black increasing in size with age; abdomen and under tail-coverts white. The female is rather smaller than the male. In young birds the beak is dark grey, tinged with pink, the nail greyish white, while the black bars on the breast are slightly developed. In the juvenile plumage a black frontal band takes the place of the black and white band of the adult, the belly is light grey with dusky spots. The beak is grey tinged with flesh colour, and the nail is grey, while all the feathers are much narrower than in the adult. Young in down dark grey. [W. P. P.]

2. Distribution.—This species is only a winter visitor to our islands, and its breeding grounds lie in the Far North. It has not been found nesting in Scandinavia, but according to Goebel it breeds in Russian Lapland, and also nests on Kolguev, Novaya Zemlya, the Kola and Kamir Peninsulas; while in Asia its breeding range includes the lower Ob and Yenisei, the Taimyr, Great Liakoff Isles, and the

tundra of Eastern Siberia. A few pairs also nest in North Iceland, but American writers distinguish the race which is found in arctic North America and Greenland as *A. albifrons gambeli*. In winter it is found on migration throughout Europe, south to the Mediterranean and the north of Africa, and casual on Madeira, while Asiatic birds reach Northern India, China, Japan, and Corea, and the American race wanders to Mexico and Cuba. [F. C. R. J.]

3. Migration.—A cold-weather visitor from the Far North in varying numbers, appearing between 29th September and 28th October (cf. Clarke, *Studies in Bird Migration*, 1912, vol. i. p. 159). In Ireland the species is abundant and widespread in winter, both inland and on the coasts: October to late April is the period of its stay, but there are also records for September and May (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 177). In Great Britain it is only abundant locally, chiefly on the coasts. Islay, the Northern Isles, and the Moray Firth are notable Scottish localities, while in England it is the southern and south-western districts that are most favoured (cf. Saunders, *Ill. Man. B. B.*, 2nd ed., 1899, p. 399). Gregarious. [A. L. T.]

4. Nest and Eggs.—Does not breed in the British Isles. [F. C. R. J.]

5. Food.—Young shoots of various aquatic plants, grass, clover, corn when and where it is to be had, and wild fruits: the young feed on insects, snails, and Crustacea, and display a fondness of the "mares-tail" (*Equisetum*); they are accompanied in their search for food by both parents. [W. P. P.]

BEAN-GOOSE [*Ánser fabális* (Latham). Grey-goose (generic), bog-goose, harvest-goose. French, *oie sauvage*; German, *Saat-Gans*; Italian, *oca granaiola*].

1. Description.—In the bean-goose the nail and basal part of the beak are black, enclosing a large orange-coloured area, and the legs are orange. The sexes are alike. (Pl. XXVI.) Length 34 in. [863·0 mm.]. The upper parts are brownish grey, much darker—chocolate—on the scapulars and interscapulars, which are marked by bars of greyish white formed by the tips of the feathers; the inner secondaries are similarly edged with greyish white, and the lesser wing-coverts are mouse-coloured. The lower back and rump are dark brown, the sides of the latter and the tail-coverts white. The under parts are white shading into brown on the throat, breast, and flanks, which are barred with greyish white. Immature birds have the pale tips to the back and flank feathers tinged with rufous, and the feet yellow rather than

orange. The juvenile plumage is an earthy grey colour, paler on the under parts; the secondaries edged with white. The legs and feet greyish yellow. The young in down is of a light grey, the beak blackish, and the legs dead black. [W. P. P.]

2. Distribution.—This species is also a winter visitor to our islands. It is frequently stated to breed in Iceland, but there is no confirmation of this statement; and there is much difference of opinion as to whether two species have been united under one name, *A. fabalis* (or *segetum*) and *A. arvensis*. Some form of bean-goose breeds in Scandinavia north of lat. 64°, as well as in the Kola Peninsula, Lapland, and the Archangel and Olonetz governments and south to lat. 62° in Finland. It breeds in large numbers on Kolguev, Novaya Zemlya, and the Petschora district, and also ranges into Siberia, but there seems little doubt that the East Siberian birds at any rate are separable. During the winter months the migratory movements of this species extend south to the Mediterranean and Black Seas, and in Asia it has been met with in Palestine and on the Caspian, while the eastern form visits China and Japan, and some race has been recorded as a casual from Madeira. Statements of breeding in E. Greenland probably refer to the pinkfooted-goose, but the whole literature of this species is still in a very confused state. [F. C. R. J.]

3. Migration.—A cold-weather visitor from the north, exceptionally appearing as early as 11th September, but usually between 5th October and 3rd November, and remaining till April or May (cf. Clarke, *Studies in Bird Migration*, 1912, vol. i. p. 159; and Nelson, *B. of Yorks.*, 1907, p. 413). It visits parts of Great Britain in large numbers, but is much less common than the pinkfooted-goose on the east coast. It visits Ireland mainly in severe winters, and is usually neither very common nor widespread (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 177). Our information regarding the migration and winter distribution of the various "grey geese" is unsatisfactory, owing to the fact that the exact species is very frequently unascertainable in the field. Of the migratory habits of the genus we may say that the birds travel both by day and by night, and in large flocks which very often display the characteristic flight-formations. [A. L. T.]

4. Nest and Eggs.—Does not breed in the British Isles. [F. C. R. J.]

5. Food.—Corn and rice in cultivated districts, grass and other vegetation, and in autumn wild fruits: the young feed on insects, snails, and Crustacea, but as to their guardianship by the parents nothing is known. [W. P. P.]

PINKFOOTED-GOOSE [*Ánser brachyrhýnchus* Baillon. Grey-goose (generic), black-nebs (Scotland). French, *oie à bec court*; German, *Kurzschnäbelige Gans*].

1. Description.—The pinkfooted-goose may readily be distinguished by its relatively short beak, wherein the nail and the upper part of the basal portion are black, the rest pink, and the legs pink. The sexes are alike. (Pl xxvi.) Length 28 in. [711·0 mm.]. The male has the upper parts brown, the scapulars and flank feathers broadly edged with light grey, major coverts slate-grey, broadly tipped with white. Lesser wing-coverts ash-grey. The breast is rufous brown, pale edges to the feathers giving a somewhat barred effect. Immature birds are duller in coloration, and have less pink on the beak. The young in down grey. [W. P. P.]

2. Distribution.—Another winter visitor, especially to our eastern coasts. It breeds in considerable numbers in Spitsbergen, and almost certainly also in Franz-Josef Land. Possibly a few breed also in N. Iceland. With regard to its occurrence in Greenland, we have as yet no authentic record. Its winter quarters are in North-western Europe, and its main resort is the British Isles; but it has also occurred in small numbers in Scandinavia, N. Germany, Holland, Belgium, and France, possibly also in Spain and Portugal. Records of the occurrence of this species in Southern Asia probably refer to Sushkin's goose, *Anser neglectus*. [F. C. R. J.]

3. Migration.—A cold-weather visitor from the north, mainly to the east coast of Great Britain. It is less known on the west side, although apparently increasing in the Solway Firth, and there is as yet only one Irish record. It arrives between 18th September and 18th October as a rule, but exceptionally as early as 24th August, and the time of its departure, varying to some extent from season to season, is usually about the end of April (cf. Clarke, *Studies in Bird Migration*, 1912, vol. i. p. 159; and Nelson, *B. of Yorks.*, 1907, p. 415). For habits see under bean-goose. [A. L. T.]

4. Nest and Eggs.—Does not breed in the British Isles. [F. C. R. J.]

5. Food.—Grain, and the tender blades of autumn-sown wheat, with marsh and other grasses and aquatic vegetation. Le Roi found in the stomachs of old birds shot in the breeding season, besides the usual small stones, remains of

vegetable food, including stalks, leaves, buds and roots of *Cerastium Edmonstonii*, *Saxifraga*, *Equisetum arvense*, etc. Three young contained leaves and buds of *Salix reticulata*, but no small stones. [W. P. P.]

BARNACLE-GOOSE [*Bránta leucópsis* (Bechstein); *Bernícla leucópsis* (Bechstein). French, *bernache à joues blanches*; German, *Weisswangen-Gans*; Italian, *oca faccia bianca*].

1. Description.—The barnacle-goose may at once be distinguished in having a white head, save for the crown and nape, which, like the neck and fore-breast, are glossy black. The beak and legs are black, and a more or less well-marked black bar runs from the base of the beak to the eye. The sexes are alike (Pl. XXVII.). Length 27 in. [685·8 mm.]. The mantle and wing-coverts are lavender-grey, barred with black and white; the breast is greyish white, while the flanks are white barred with grey. The juvenile plumage differs from that of the adult in having the white of the head washed with brown. Young in down dark grey, paler below. [W. P. P.]

2. Distribution.—A winter visitor, chiefly to the west side of Scotland. The only certainly known breeding-places at present are Spitsbergen, where Professor Koenig obtained three clutches of eggs in 1907 and 1908, and North-east Greenland, where Manniche observed a colony of about one hundred and fifty birds on the precipitous face of Mount Trekroner, near Cape Bismarck, but found the breeding-sites inaccessible. A pair apparently nested on the Lofoden Islands, but this is quite exceptional. Whether it also breeds in Kolguev, Novaya Zemlya, or North-west Siberia is not yet known; but judging from its known habit of nesting on cliffs, Kolguev would seem to be unsuitable for that purpose. Its normal winter range extends to the shores of the Baltic and North Seas, and it has been recorded from Russia, Scandinavia, N. Germany, Denmark, Holland, and France, while as a rare casual it has been obtained in S. Spain and Italy, and observed in Morocco, and has also been recorded occasionally from eastern North America. [F. C. R. J.]

3. Migration.—A cold-weather visitor from the Far North. It has been recorded as early as 10th July, but more usually appears between 16th September and 24th November (cf. Clarke, *Studies in Bird Migration*, 1912, vol. i. p. 159). It

will be noticed that little is known of the summer haunts of the species, but a large proportion of our birds appear to come to us from a north-westerly direction. It is thus most abundant on the west coast of Great Britain, very notably in the Solway Firth, and on the north-west coast of Ireland (also locally on the coast of Louth). At Aranmore (off Donegal) it is first seen in October, sometimes in September, and passes in flocks, both by day and by night, at intervals till the end of the month: they leave by the first week of May (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 182). They reach the Solway, in variable but apparently decreasing numbers, with great regularity between September 28 and 30, always in the afternoon or evening: between April 18 and 20 they leave at nightfall in a northerly or north-westerly direction (cf. Gladstone, *B. of Dumfries.*, 1910, p. 251). Forty birds, in two flocks, were recorded from the Solway as late as 4th July 1908, and a single bird, probably ailing, remained there throughout the summer of 1886 (cf. Gladstone, *loc. cit.*). It will be gathered from the above that the barnacle-goose travels both by night and by day. It is markedly gregarious: a vast flock, estimated as numbering as many as ten thousand, was seen on the Solway flats in early October 1881—they had apparently just arrived, as they were so tired that they could be approached to within thirty yards (cf. Service, *Annals Scot. Nat. Hist.*, 1903, p. 199). [A. L. T.]

4. Nest and Eggs.—Does not breed in the British Isles. [F. C. R. J.]

5. Food.—Grass obtained from pastures near the sea, aquatic weeds, Crustacea, and aquatic insects. Le Roi records leaves of *Oxyria digyna* and stalks of grasses from a goose shot in the breeding season in Spitsbergen. Food of young unknown. [W. P. P.]

BRENT-GOOSE [*Bránta bernícla bernícla* (Linnæus); *Bernícla brénta* (Pallas). Clatter-goose, ware-goose, road-goose, horra-goose (Orkneys). French, *bernache cravant*; German, *Ringel-Gans*; Italian, *oca columbaccio*].

1. Description.—The brent-goose is easily distinguished by the black colour of the head and neck, the latter with a white patch on each side, and the great length of the white upper and under tail-coverts, which completely conceal the tail. The sexes are alike. (Pl. XXVIII.) Length 22 in. [558·0 mm.]. The scapulars and interscapulars are sooty black. Fore-breast black, lower breast and fore-part of the abdomen greyish brown, hind abdomen and under tail-coverts white, legs black. In the juvenile plumage the white patches are wanting; the

fore-breast is grey like the belly and flanks, and the latter lack the light bars of the adult. The wing-coverts have whitish tips, and the inner secondaries whitish margins. The young in down are dark grey above, greyish white below cheek, and throat whitish. [W. P. P.]

2. Distribution.—The commonest of the geese which visit us in winter. Its breeding grounds include Franz-Josef Land, Spitsbergen, Kolguev, and Novaya Zemlya, but not on the mainland of the European continent. In Asia, however, it breeds on the Taimyr Peninsula and on the river Yenisei (lat. 72° N.). In Greenland and the north-east of arctic N. America it is replaced by the light-breasted form, while the black brent replaces it in the arctic regions of Western America and arctic Siberia from the Lena eastward. The normal winter range of this species extends to the shores of the Baltic and North Seas, but occasionally it has been recorded from some distance inland, and has occurred as a straggler even in the Mediterranean and on the coast of Marocco. [F. C. R. J.]

3. Migration.—A cold-weather visitor from the Far North in great numbers, generally appearing between 20th September and 21st November, although exceptionally recorded as early as 12th August (cf. Clarke, *Studies in Bird Migration*, 1912, vol. i. p. 160). It is more abundant on the east coast of Great Britain than on the west—it will be noted that the reverse is the case with the barnacle-goose—but is also numerous on the Irish seaboard. On the last named, birds may be seen in September, or even in August, but their numbers are greatly augmented during October and November: departure takes place in April, some birds remaining till May (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 183). On the Yorkshire coast the main body does not usually arrive till after Christmas, although odd examples may be seen from September onwards: departure takes place in March, but some birds remain till May or even June (cf. Nelson, *B. of Yorks.*, 1907, p. 426). Gregarious; but even when large numbers are present they may pass unobserved, as the species keeps much more to the sea than is the case with the various "grey geese." "In the stomach of a brent-goose, shot on the Yorkshire coast, were found specimens of a mollusc (*Crenella faber*), the only known locality for which is the Sea of Ochotsk; thus proving that wild-fowl will travel enormous distances in a short time" (Harting in Nelson, *op. cit.*, p. 427). [A. L. T.]

4. Nest and Eggs.—Does not breed in the British Isles. [F. C. R. J.]

5. Food.—*Zostera ulva* and other sea-weeds, molluscs and Crustacea. Le Roi states that besides small stones and earth, as well as remains of *Fucus*, moss

and grasses, stalks and leaves of *Oxyria digyna*, Saxifrages and other Phanerograms were identified. Roemer and Schaudinn found mussels, as well as grass and other vegetable matter. Young in down, according to Le Roi, are fed on *Gramineæ* and *Oxyria*, and Walter records freshwater algæ in the stomach of one bird. [F. C. R. J.]

12. THE GEESE

[W. P. Pycraft]

That the Geese stand nearer to the ancestral stock of the Anseriformes than either the Ducks or the Swans there can be no reasonable doubt. And there is therefore no occasion for surprise to find that they are less specialised than either, though possessing the common characteristics of both. Only among the geese do we find longitudinally striped young: they display no seasonal and rarely any sexual peculiarities of plumage, and they lack the eccentricities of development in the matter of the trachea which is so characteristic of the ducks and swans, though in this particular the aberrant Anseranas must be excluded. In the bristly armature of the fleshy tongue they more nearly resemble the swans than the ducks, and in the denticulation of the beak they differ from both, as also in the peculiar shape of the beak, and the singular longitudinal grooves which divide the feathers of the neck.

Gregarious at all times, on the wing these birds fly in ∧- or sometimes in M formation, and such companies are known among sportsmen either as a "skein" or a "gaggle" of geese; but the origin of the terms "gander" for the male and "goose" for the female dates from Anglo-Saxon times.

13. THE "GREY" GEESE

The four species which are commonly associated under the term "grey geese" are undoubtedly closely related, and this is shown not only by their coloration, but also in their habits. Only one, the "greylag," breeds so far south as Great Britain, the rest—the white-fronted, bean, and pinkfooted-geese—with their congeners to be

considered presently, finding a more congenial environment for the nurture of their offspring in the Far North. When in the autumn the grey geese seek our shores, they display an almost inordinate love of grain, which they find on the stubbles—though less is to be gleaned now than in days gone by. After the ploughing, the tender blades of grass and clover form their staple fare. Normally they feed by day and sleep by night. But in October, when they first arrive, the fields are full of labourers, and to avoid them the birds huddle together in their roosting quarters on the sand-flats by the shore, or seek suitable cover inland. This disturbing factor is commonly left out of account by those who describe these birds as night feeders.

We know more perhaps of the breeding habits of the greylag than of the three other species to which we have referred, but when all is said this knowledge, which, be it noted, has been gained from observations made on their northern breeding haunts, does not amount to much. Like its congeners, the greylag pairs for life, and thus it is that, arrived on its breeding grounds, nest building is at once begun. Young birds breed possibly in their second year, more probably in their third, and the competition for females among the bachelors occasions some great fights. The younger, unmated, ineligible birds live in the breeding colony, but keep in separate flocks.

The gander takes no part in the duties of incubation, and this is true of all the Geese. But he jealously guards his mate while sitting, and the young when these appear. They are taken down to the water within an hour or two of hatching, where an abundance of insect food, grass, and water-weeds can be relied on. At the end of the day they are brought back to the nest and brooded by the female. In the case of the death of both parents the goslings join other broods, and seem to be willingly adopted by the parents thereof.[1] When about to venture forth to feed, the female thrusts her head out from the reeds and takes a careful survey. If all is

[1] Alpheraky, *Geese of Europe and Asia.*

Grey Geese: Whitefronted-goose; Pinkfooted-goose;
Bean-goose; Greylag-goose

By H. Grönvold

well she sallies forth with her young streaming after her. The gander brings up the rear. If he is the least suspicious he sounds a note of alarm; if his warnings are well founded, and danger imminent, he takes flight immediately, leaving his family to fend for themselves.

According to Naumann, the greylag occasionally gets an attack of "nerves," and both parents will make off with their young to some small sheet of water promising, or seeming to promise, a greater security against surprise by enemies. Having attained their goal, they will then immediately return to the place whence they started, and they will persist in this course with extraordinary obstinacy. Such erratic wanderings may entail a march of several hours across fields, through woods, and even through settlements, so that in their aimless meanderings the young fall victims to foes of all sorts, or perish from the hardships of the journey. Having regard to the fact that swallows will abandon their young in obedience to the migratory instinct, it may be that these strange wanderings are made, not in the interests of the young, but of the parents, who seek a secure retreat for that perilous period, the annual moult, when, for a time, they will be flightless.

More than a hundred years ago, perhaps a hundred and fifty would be nearer the mark, the greylag-goose bred in numbers in our English fens, where the young were annually taken and kept in a more or less reclaimed condition with vast flocks of tame geese, which, it may be remarked, are a domesticated race of this species. Darwin,[1] in commenting on this fact, remarks that though the reclamation of the greylag must date back to very remote times, yet scarcely any animal which has been tamed for so long a period has varied so little, for, save in the case of the white race, these domesticated birds differ but slightly from the wild stock.

That the greylag and the whitefronted-goose are near allies there can be no doubt, indeed the latter would seem positively to

[1] *Animals and Plants under Domestication*, vol. i. p. 287.

have been derived from the former, since it is distinguished therefrom in its exaggeration of features, which in the greylag might almost escape notice. For it will be remembered the greylag shows a more or less distinct line of white around the base of the beak, and indistinct black bars on the chest. These are the distinguishing marks of the whitefronted, by reason of their conspicuous development—at any rate in the adults. It seems, moreover, to be a species in what we may call a state of unstable equilibrium—which is characteristic of evolving species. At any rate it is subject to great variation in size, and seems to have split up into two or three well-marked races or subspecies. We are here, however, concerned only with the typical form, *Anser albifrons*, a winter visitant to Great Britain, local in its distribution and erratic in its appearance. Since it resorts, like its congeners, to the arctic regions to breed, occurring in both hemispheres, it is not surprising to find that nothing is known of its life-history at this critical period, though its eggs and nests have been taken frequently.

Trevor-Battye, however, lifts the veil, so to speak, for a moment, in his most interesting book, *Icebound on Kolguev*, wherein he cites a case where a snowy-owl attacked the young of a pair of white-fronted-geese. Both birds came to the rescue. The gander, flying right up at the owl, from the water, struck out with his wings, causing the marauder to beat a retreat. In another place (p. 207) this author remarks that the young, when pursued in the water, will sometimes effect an escape by diving.

Alpheraky gives us some interesting notes on its migratory movements and flight, gleaned from Eversmann's observations in the neighbourhood of Orenberg. Commenting on the fact that these birds from time to time shift their migration routes, he remarks that on migration they fly like other geese, in a chain, key, or cone; but on short flights, as when setting forth to feed on the steppes, and back again to water, they travel in a disorderly crowd, or in a bunch. In the Don steppes Alpheraky says he has flushed them in swarms of

tens of thousands; but having once risen, the hosts immediately broke up into comparatively small flocks, and flew off, one after another, either to another part of the steppe or to water, uttering all the time their loud, laughing cackle.

Of the bean-goose it may be remarked that until recently but one species was recognised; but Alpheraky and other Continental ornithologists now hold that the term "bean-goose" has been inadvertently applied to some seven or eight forms of this bird entitled at least to subspecific rank; wherein, therefore, this bird resembles the whitefronted species in being in a state of unstable equilibrium. But be this as it may—and we doubt the validity of at least some of these subspecies—but one, the typical bean-goose, *Anser fabalis*, is recognised as entitled to a place on the British list. Alpheraky, however, dissents from this, and contends that the great majority of the geese known as bean-geese wintering in Great Britain are yellow-billed bean-geese, *Anser* (*Melanonyx*) *arvensis*. As, however, the distinguishing marks between the two so-called species are furnished only by slight differences in the shape and coloration of the beak, and still more subtle differences in plumage, we prefer to regard them as differences due to individual variation, and perhaps to age only.

In its habits and general appearance the bean so closely resembles the pinkfooted-goose, that the two species cannot well be considered apart in these pages. Indeed, in the matter of plumage they are so alike that Seebohm contended that the pinkfooted-goose is no more than a subspecific form of the bean-goose; with which, however, later ornithologists do not agree.

With us the bean-goose and its congener the pinkfooted-goose display the same habits, passing the night on the dry sand-flats, and proceeding at dawn to feed on the stubbles, or failing these to wherever an abundance of grass is to be had. And to these observations on this aspect of their life we may add those of Alpheraky,[1] who

[1] *Geese of Europe and Asia*, p. 75.

remarks that "during the daily rest the bean-geese do not stay long on the water, but when possible, having drunk their fill, swim off to the shoals, or land on sandbanks or islands. During rest, when feeding, these geese throw out sentinels, from time to time relieved by others which have already rested or satisfied their hunger. Sentinels are also placed at night to watch the sleeping flock. Neither on the sea nor on lakes or rivers do geese pass the night on open water, but having swum about and chattered among themselves, the flocks either swim into the growth along the banks, or push out on to the shoals to spend their time in rest till the first gleams of the rising sun. Only for want of such spots do scared flocks in some cases pass the night on open water."

As to the posting of sentinels, we are convinced that is but a pretty conceit, without evidence in fact. Geese are wary birds, and some among a sleeping or otherwise occupied crowd are sure every now and then to look up to assure themselves that all is well, and hence the notion of sentries.

Be it noted that while the winter visitations of the bean-goose to Great Britain seem to be declining in numbers, the contrary seems to be the case with the pinkfooted species. And this is supposed to be due to the contraction of the range of the first named, in consequence of the ever increasing areas under cultivation; but this explanation is hardly satisfactory, since what would affect the one would equally affect the other, in that the two birds throughout their range affect the same environment. Of the pinkfooted-goose when nesting, Mr. Trevor-Battye remarks that the gander at times quits his guard post by his sitting mate and begins to walk round and round her, by a regular well-beaten path, meeting any unbidden approach with a prolonged series of short, high notes, recalling those of the brent-goose. When travelling with their young, if alarmed, they will run along, then squat down, stretching the neck along the ground in the attitude assumed by the thick-knee under like circumstances.

Though Seebohm had the good fortune to explore the breeding

Barnacle-geese
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haunts of the bean-goose, he apparently saw nothing of the courtship of these birds, but succeeded in taking its eggs, in the tundras of Dvoinik, in the valley of the Petschora. Soon after the young are hatched, he remarks, the old birds, with their offspring, gather into large flocks and march off into the tundra, where the adults must undergo that most trying ordeal, the annual moult. They march like a regiment of soldiers—the old birds in front, the youngsters in the rear. But ere the start is made the casting of the feathers has already begun. During this period of defencelessness appalling inroads on their ranks are made by the Samoyeds, who surround the helpless birds and kill them with sticks by thousands.

14. THE BRENT- AND THE BARNACLE-GEESE

So much for the "grey" geese. We must now briefly review the life-history of two species which differ from the foregoing in a very striking manner, not only in appearance but also in habits. These two are the brent- and the barnacle-geese. The grey geese are essentially land-birds, the two now to be considered are pre-eminently marine-birds, rarely leaving the immediate neighbourhood of salt water, at any rate during the winter months, which they spend on mud-flats in estuaries, where they find an abundance of their favourite food, the Zostera weed.

Before we proceed further, it is necessary to remark that besides the typical species, with which most of my readers must be familiar, two other geographical races, or subspecies, are now recognised—these are the pale-breasted and the black brent-geese. Both find a place in the list of British birds. They, however, are but occasionally met with in these islands, and differ but slightly from the brent-goose, *Branta bernicla*. Of the black brent, indeed, not more than a score have been recorded.

The typical brent-goose, like the barnacle, comes south only to

avoid the rigours of winter in its home in the Far North. A few may put in an appearance on our east coast by the end of October, but not until Christmas has turned do they appear in any numbers. During January their ranks are continually reinforced, and the maximum is attained during February, when, in severe seasons, incredible numbers seek sanctuary with us.

The brent and the barnacle, though presenting much in common both in appearance and breeding range, yet afford some striking differences in their choice of habitat, at any rate in so far as winter quarters are concerned. Thus, while the barnacle-goose chooses our western shores, the brent evidently prefers the eastern, where, on occasion, it is to be met with in thousands: on the north coasts of France, according to Naumann, they occur during some years in millions, and their cries drown the roar of the waves, and their swarms from afar darken the light like smoke. The barnacle-goose, on the other hand, never occurs in great numbers. The brent shows a partiality to estuaries and mud-flats; the barnacle, for grass-covered islands, and even for pasture when this lies near the sea. With the brent it is never friendly, and seems even to avoid its company. In localities where the two live together, the barnacles keep in flocks by themselves and aloof from their neighbours.

Of the brent-goose in winter Mr. Abel Chapman remarks they spend the night at sea and the day on the tidal oozes, but they never go inland to feed in the fields, or travel a single yard beyond high-water mark. Their reluctance to remain long out of the water is a factor in all their habits, since at frequent intervals they must go afloat to drink, splash about, and preen themselves. Their favourite food seems to be the sea-grass or Zostera laid bare at low tide, and when feeding on this they advance in close order, all heads down. But they are wary birds, and every now and then one or more will cease feeding to survey the country, and thus avoid surprise by an enemy. But even at full tide, should they still be hungry, they will contrive to secure a sufficiency by a sort of semi-dive, submerging the fore part

of the body till only the hinder half is above water, duck-fashion. They appear never actually to dive save when wounded.

"Just at dark," says the author just quoted, "the whole host rise on the wing together and make for the open sea. In the morning they have come in by companies and battalions, but at night they go out in one solid army. . . . The whole host, perhaps ten thousand strong, here massed in dense phalanxes, elsewhere in columns trailing off into long skeins, Vs, or rectilineal formations of every conceivable shape (but always with a certain formation)—out they go full one hundred yards high, while their loud clanging defiance—'*honk, honk!—torrick, torrick*,' and its running accompaniments of lower croaks and shrill bi-tones, resounds for miles around."

Of the breeding habits of the brent-goose we know practically nothing, and the same is true of the barnacle. But Mr. Trevor-Battye has given us a vivid account of the fate which overtakes thousands of these birds annually on Kolguev at the moulting season.[1] When the birds are at their most helpless stage their island retreat is invaded by the natives in boats, who contrive to get behind the host so as to cut them off from the sea and drive them inland into a huge net arranged somewhat after the fashion of a duck-decoy net. The driving is carried on with all the stealth imaginable, for among the swarm are hundreds of "grey geese"—bean- and whitefronted, and these, as yet, can fly. If they take the alarm, the brents, the birds which alone are coveted, will scatter in all directions. Soon, however, all have been driven into the water, and towards their doom; and now the grey geese rise and circle round in hundreds, till they are lost in the mist. Some, however, have lost their quills, and these, taking alarm, slowly sink themselves. "First they laid out their long necks flat on the water, then, as the boats came nearer they sank their bodies till the water was almost over their backs. They looked like bits of stick. When a boat approached a bird it would just sink its head and shoot forward under the water. They never went down like diving ducks."

[1] *Icebound on Kolguev*, p. 219.

The brents never attempted to dive, which is the more curious since they are more aquatic than the grey geese in their mode of life. "Only like a pack of idiots they 'wauked' and swam along." At last the poor victims reach the mouth of the net, and pause. This is an awful moment for the Samoyeds. Will the birds "break." Hemmed in as they are by boats ranged in a half-circle escape is almost impossible, but nevertheless till the mouth of the net is entered the time is an anxious one. At last a single old goose, a bean-goose, steps out and runs up the bank; one or two more follow, then the first of the brents. And now they have started the rest is easy; they scamper headlong into the net, and then men close in behind. Of all that army, every brent was captured. Then followed the sickening scene of the killing. One by one the wretched birds were seized by the head and swung quickly round, by which means the neck was dislocated. Then the body was flung over the net to willing hands outside. When the last had been tossed over the counting began—3300 brents, 13 bean, 12 whitefronted. This done, the heap was divided, so many to a choom or family. After this they are brought across to the mainland, and stored for the winter.

That these birds breed on Kolguev there can be no doubt. But Mr. Trevor-Battye could never get the natives to reveal their breeding-place. Indeed they themselves never visit it, for fear of disturbing the birds; and they take every precaution to keep away curious visitors. One can understand their anxiety on this head, for the brent-goose is their mainstay of life throughout the winter. Similarly, as we have already remarked, are the bean-geese depleted by the Samoyeds in the valley of the Petschora.

Brent-geese
By A. W. Seaby

15. THE SWANS

PRELIMINARY CLASSIFIED NOTES

[F. C. R. JOURDAIN. W. P. PYCRAFT. A. L. THOMSON]

WHOOPER [*Cýgnus cýgnus* (Linnæus); *Cýgnus músicus*, Bechstein. Wild swan (generic), elk, whistling-swan. French, *cygne sauvage*; German, *Sing-Schwan*; Italian, *cigno selvatico*].

1. Description.—The adult whooper may always be distinguished by its large size and the light lemon-yellow colour of the basal half of the beak, the remainder of which is black. The sexes are alike, and there is no seasonal change of coloration. (Pl. XXIX.) Length, male 60 in. [1524 mm.]. The plumage is entirely white; the yellow of the base of the beak is continued backward as a narrow band of bare skin to the eye. The iris is dark brown, and the legs and toes are black. The head and neck have occasionally an ochreous tinge; more rarely this is intensified and assumes a dark copper hue. The juvenile dress is of an ash-brown colour, the under parts paler, while the beak is of a dull flesh colour, tipped and margined with black, and enclosing a central area of orange-yellow; lores greenish white; the legs are also flesh coloured. The completely white dress is not assumed till the third year. Young in down white. [W. P. P.]

2. Distribution.—Up to the end of the eighteenth century this fine bird bred at the lochs of Harray and Stenness in the Orkney group, but since that time it has only been known as a winter visitor to our islands. Its breeding haunts include Iceland, Finmark in North Norway, and it is said in the Saltdal (lat. 67° N.), in Sweden, North Finland, Lapland, and in Russia not only on the lower Dwina and Petschora, but also, according to Mr. Buturlin, in several of the eastern governments, south to the Sea of Azoff and the shores of the Caspian. In Asia it is

said to breed in Turkestan, the Tobolsk and Tomsk governments, Northern Siberia south of the Arctic Circle, and east to Kamtschatka and Ussuria. On migration it visits the Færoes, the coasts of the North and Baltic Seas, and continental Europe south to the Mediterranean and North African coasts and the Black Sea; in Asia ranging south to Asia Minor, Palestine, Persia, Central Asia, the Punjab, Sind, and once in Nepal, China, Japan, Saghalien and the Commander Islands, and occurs casually in East Greenland. [F. C. R. J.]

3. Migration.—A winter visitor from Northern Europe, occurring annually on the Scottish coasts from October or November onwards, and sometimes lingering till May, although no longer a British breeding species. Mr. Eagle Clarke gives 21st October to 14th November as the usual date of arrival, and 6th October as an early record (cf. *Studies in Bird Migration*, 1912, vol. i. p. 160). The numbers that visit us vary greatly with the season, and it is chiefly in hard winters that the whooper occurs on the English coasts, being then recorded even from the south coast. It has occurred in Yorkshire as early as 19th October, but is most common in January and February: 1829, 1838, 1865, 1871, 1894-95 are years in which it was especially abundant, and in 1880 a flock of at least one thousand birds was recorded (cf. Nelson, *B. of Yorks.*, 1907, p. 428). It occurs irregularly on the coasts and marshes of Kent (cf. Ticehurst, *B. of Kent*, 1909, p. 338), and it is not uncommon on the coasts of North Wales, although rarer inland (cf. Forrest, *Fauna N. Wales*, 1907, p. 272). In Ireland the whooper occurs irregularly in all parts, but mainly in the north-west (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 184). It is not always possible to distinguish between this species and Bewick's swan in the various reports, but in Ireland the whooper is supposed to be outnumbered by about twenty-five to one (cf. Ussher and Warren, *loc. cit.*), and in the south-west of Scotland it is believed to be the less regular visitor of the two (cf. Gladstone, *B. of Dumfries.*, 1910, p. 255). A gregarious migrant, which travels both by day and by night; it has been observed passing over the city of Dublin at night (cf. Patten, *Aquatic Birds of Great Britain and Ireland*, 1906, p. 79). [A. L. T.]

4. Nest and Eggs.[1]—The nest is placed in Iceland nearly always on an islet, rarely on a spit of land or in a secluded bit of marsh among the hills. In North Russia it is often found in the willow swamps of the deltas of the great rivers. In shape it is conical, with a hollow at the top to hold the eggs, and is built of tufts of grass, turf, moss, vegetable rubbish, and in some cases a few twigs

[1] Pinioned birds of this species bred in the Shetlands in 1910, and it seems possible that it might be re-established as a breeding species if protected.

of *Salix lanata* and *Vaccinium uliginosum*. Earth and even stones are sometimes used. Faber states that the nest is built by the female, but in captivity a male bird has been seen to shape the nest with his breast as the mute-swan does, and it is more probable that he takes some part in the work. Feathers and down are scattered about, but there is no regular down lining, as with the Geese and Ducks. The eggs are large, creamy white when fresh, but soon stained with peat and mud till they assume a dirty reddish brown hue from nest stains, but have no greenish tinge. They vary, as a rule, from four to six in number, rarely seven, and the average size of 58 eggs is 4·43×2·86 in. [112·6×72·7 mm.]. Incubation, according to Faber and Hantzsch, is performed by the female alone, and lasts 35-40 days (Hantzsch), 40 days (Faber), while in captivity a clutch was hatched out in 42 days at Harewood Park. From observations on a captive bird it seems probable that the male uncovers the eggs and takes short turns while the female feeds. In Iceland eggs may be found from early in May to the end of June, and I have known young to be hatched by June 14. In Russian Lapland Pearson found eggs as late as July 4, but the smallness of the clutch and the late date suggest a second laying. Only one brood is reared in the season, but two clutches may be laid if the first is taken. [F. C. R. J.]

5. Food.—The food consists, as with the other swans, chiefly of the roots and stems of aquatic plants, but grass is also eaten. St. John noted that in Scotland its food consisted almost entirely of *Glyceria fluitans* and *G. aquatica*, water grasses with bulbous roots. Naumann detected *Trifolium repens* and *T. fragiferum* in the crops of birds examined by him, and also states that its diet includes, besides aquatic plants, water insects and their larvæ, worms, small frogs, possibly also small fishes. Sand and small stones are also found in the gizzard, and corn is occasionally taken when available, as well as acorns and fruit. [F. C. R. J.]

6. Song Period.—Probably varies according to the time of breeding. In the case referred to below the birds had not begun to nest, although other pairs had young on the water. [F. C. R. J.]

BEWICK'S SWAN [*Cygnus bewickii* Yarrell. French, *cygne de Bewick*; German, *Schwarznasiger Schwan*; Italian, *cigno minore*].

1. Description.—Bewick's can readily be distinguished from the whooper-swan, which it resembles, by its much smaller size, and the fact that the orange-yellow of the base of the beak is much smaller in area, not extending beyond the

nostrils. (Pl. xxix.) Length, male 50 in. [1269 mm.], female smaller. The plumage is entirely white; the iris is dark brown, and the legs and toes are black. The juvenile dress is greyish brown, the iris yellow. The young in down greyish white. [W. P. P.]

2. Distribution.—Although Buturlin (quoted by Dresser) includes the Kola Peninsula and the White Sea in the breeding range of this species, there seems to be but slight evidence as yet in support of this view. Goebel records it in spring from the West Murman coast, but Pleske did not include it in the breeding species of the Kola Peninsula. It does undoubtedly breed in the deltas of the Petschora and other rivers flowing into the Arctic Ocean, as well as on Kolguev, possibly on Waigatz, and certainly on Novaya Zemlya. Its range extends eastward along the Arctic shores and islands of Siberia, but from the Lena delta to the Sea of Okhotsk it is replaced by a larger race. On migration it visits the British Isles (especially Ireland) often in considerable numbers, and has occasionally been met with in Norway, Sweden, Denmark, Holland, Belgium, Germany, Helgoland, France, Spain (once), Italy, the Dalmatian coast and Hungary (once), while it is more frequently met with on the lakes of Finland and the Russian Baltic provinces, wintering in Turkestan and occurring casually on the Caspian. The eastern form apparently migrates through Korea, Manchuria, and Ussuria to the coasts of Japan and China. [F. C. R. J.]

3. Migration.—A winter visitor from the Arctic regions east of the White Sea, usually arriving between 3rd and 30th November, although recorded as early as 10th October (cf. Clarke, *Studies in Bird Migration*, 1912, vol. i. p. 160). The numbers vary greatly with the severity of the season: in hard winters it is not uncommon on the coasts of Yorkshire and North Wales (cf. Nelson, *B. of Yorks.*, 1907, p. 429; and Forrest, *Fauna of N. Wales*, 1907, p. 271), but it is only occasionally recorded from Kent (cf. Ticehurst, *B. of Kent*, 1909, p. 340). It is more numerous in Scotland, especially on the west coast and in the Outer Hebrides. In Ireland it is a regular and sometimes an abundant visitor to Ulster, Connaught, and parts of Kerry, and an occasional visitor to the remainder of Munster and to Leinster; it arrives early in December as a rule, and leaves late in February, but it has been recorded early in October and also in March (cf. Ussher and Warren, *B. of Ireland*, 1900, pp. 185-6; and Patten, *Aquatic Birds of Great Britain and Ireland*, 1906, p. 80). For remarks on the relative abundance of the whooper and of this species, see under the former. Gregarious: flocks of thousands are to be seen in Ireland in severe winters. [A. L. T.]

4. Nest and Eggs.—Does not breed in the British Isles. [F. C. R. J.]

5. Food.—Chiefly the succulent stalks, leaves, and buds of aquatic vegetation, torn up from the bottom in shallow water, and no doubt also the larvæ of aquatic insects, worms, etc. Naumann also recognised among the remains of other water plants *Trifolium repens*. Thompson found minute seeds and gravel in the stomach of an Irish killed specimen. Grass no doubt also forms part of its diet. J. H. Gurney found in a Norfolk killed bird, silt, pond grass, water insects' legs, and the tail of a small fish. The young are accompanied and tended by both parents (H. J. Pearson). [F. C. R. J.]

MUTE-SWAN [*Cýgnus ólor* (Gmelin). Cob (♂), pen (♀), cygnet (juv.). French, *cygne*; German, *Höcker-Schwan*; Italian, *cigno reale*].

1. Description.—The mute-swan may at once be distinguished by the fleshy excrescence—the "berry" at the beak—which is of a reddish orange, save the nail, and the edges of the upper jaw, which are black: a broad black band extends from the base of the beak backward to the lores, and upwards to embrace the "berry," and the nostrils are marked by a black patch. The sexes are alike, but the "berry" is smaller in the female. (Pl. xxix.) Length 60 in. [1524 mm.]. The plumage is white; and the iris is dark brown, the legs and toes black. The juvenile plumage is of a sooty grey, paler on the neck and under surface, while the beak and legs are grey. The young in down are of an ash-grey colour. [W. P. P.]

2. Distribution.—It is by no means easy to distinguish between the range of wild birds of this species and those which were originally introduced and have reverted to natural conditions. In the British Isles it is generally regarded as semi-domesticated, but on the Continent it is said to breed ferally in Denmark, Sweden, and North Germany, and certainly does so in the delta of the Danube, while till recently it also bred in small numbers in Greece. In South Russia it also nests in some numbers on the great rivers and lakes and in the Sea of Azoff and the islands on the Caspian, ranging north to lat. 57°. In Asia it is recorded as breeding in Transcaspia, Persia (Seistan), the Tobolsk and Tomsk governments, Turkestan, Mongolia, and Ussuria. On migration it has occurred on the southern shores of the Mediterranean from Marocco to Egypt, and in Asia ranges south to north-west India. [F. C. R. J.]

3. Migration.—Resident in a semi-feral condition in nearly every part of Great Britain and Ireland, but an increase has been observed in the south of England in hard weather (cf. Ticehurst, *B. of Kent*, 1909, p. 341). As the species

is found in the true wild state in Denmark and Southern Sweden, and migrates thence in winter, it is probable that a few genuine wild birds occur as winter visitors in our islands (cf. Saunders, *Ill. Man. B. B.*, 2nd ed., 1899, p. 417). [A. L. T.]

4. Nest and Eggs.—As a rule the nest is placed on an islet in a lake or stream, not far from the water's edge. It is a large heap of aquatic vegetation of some sort, five or six feet across and eighteen inches to two feet high, composed of dead reeds, flags, rushes, grass tufts, etc., with a hollow on the top in which the eggs are laid. Both sexes take part in the construction of the nest, the male providing most of the material and the female arranging it, while the male bird frequently sits in the nest before the eggs are laid and shapes it by movements of the breast and tail. The eggs are large and somewhat elliptical in shape, and when freshly laid are generally dull greenish white in colour, occasionally showing patches of a deeper greenish tint under a white incrustation. This tends to wear off during incubation, and when near hatching the eggs are often a polished dirty green in colour. Young females will sometimes only lay three to five eggs in the first year, but the normal clutch ranges from five to twelve, although seventeen have been recorded from one nest (probably the produce of two females). Average size of 71 eggs 4·44 × 2·89 in. [112·8×73·5 mm.]. Incubation is performed chiefly by the female, the male remaining on guard close at hand, but he takes a short turn at incubation when she is away feeding. The estimates as to the period differ considerably, and there is probably some variation due to temperature. Oswin Lee says 34-38 days, Heinroth about 35, Saunders about 36, but a pair of Polish swan hatched out in 39-40 days (J. H. Gurney), and Heinroth says it extends exceptionally to as much as 43 days! Possibly the longer estimates include the period of sitting by the male before the eggs are laid. The usual laying time is from early April onward, but eggs have been recorded in March, and in some cases are not laid till May. Later dates are due to second layings, but only a single brood is reared during the season. [F. C. R. J.]

5. Food.—A good account of the food of this species is quoted by Stevenson from Dixon, who states that they prefer the lower forms of vegetation, *Confervæ* and *Cheraciæ*; then *Callitriche aquatica* (water starwort), and the *Potamogetons* or pond weeds. Rhizomata of all sorts of reeds, rushes, arrowheads, etc., are greedily devoured, but water-lily roots are scarcely ever touched. Soft, starchy parts of aquatic plants are eaten, and garden produce is preferred when it has been at least twenty-four hours in the water. To this list Mr. Stevenson adds the American weed, *Anacharis alsinastrum*. There seems to be no clear evidence of its devouring

fish spawn, but no doubt much is destroyed when the weeds are being pulled up. In Tiree it was observed to feed on *Potamogeton pectinatus*. Domesticated birds will also eat bread and grain, and Cordeaux states that frogs and water insects are included in their diet. The young are tended carefully by both parents, and subsist on similar food to their parents. [F. C. R. J.]

6. Song Period.—The low courting-notes of this species are only heard early in the year when the birds are pairing. [F. C. R. J.]

16. THE SWANS

[F. C. R. Jourdain]

The Swans form a small and easily recognisable group of birds, familiar in appearance to almost everybody, through the medium of the common mute-swan, which may be seen on most ornamental waters and large rivers in England. Its large size, snowy plumage, and graceful carriage on the water are so striking that even the most unobservant can hardly confuse it with any other bird, except the two rarer wild species which visit us in winter. It is also widely distributed at the present time, and in some favoured localities is extremely common. Thus the famous Abbotsbury swannery at one time is said to have contained 1300 birds, and though the disastrous winter of 1880 destroyed half the stock, the numbers remained stationary for several years at about 700 or 800, and gradually increased till in the autumn of 1911 they reached 1043.[1] Very large numbers are also to be seen on most of our large rivers, and no fewer than 481 were captured at the "swan-upping" progress of 1897 between London Bridge and Henley alone.

It is when we come to consider the status of this fine bird that we find some difficulty in deciding how far it is admissible, in a work which treats of the wild bird life of our islands and does not include domesticated animals. Like the pheasant and the redlegged-partridge, it is said to have been introduced from the Continent, but the introduction obviously took place at a very early period. Tradition ascribes it to Richard Cœur de Lion, who is said to have brought the first over from Cyprus, towards the end of the twelfth century. The earliest indisputable reference to their presence occurs in a manuscript of the date 1272. Three hundred years later they

[1] See an interesting article by Mr. Marcus Woodward, "A City of Swans," published in *Pearson's Magazine*, 1912.

must have increased enormously, for Paulus Jovius (1543) speaks of the Thames as being thickly covered with them. At the present time it is quite impossible to say whether the numerous individuals which are to be seen on our coasts and tidal waters in winter, and breed even in the Outer Hebrides and the west of Ireland, are all descended from our introduced stock, or whether among them are genuine immigrants from the Continent, where truly wild birds still exist. All the swans respond readily to protection and rapidly become tame, so that there is nothing remarkable in a wild immigrant settling down in some spot where it is unmolested and breeding there. Moreover, the semi-domesticated life led by most British-breeding swans has not resulted in the perpetuation of any variations of plumage, unless we class the occasional appearance of what are known as Polish swans under this head. Genuine wild birds from Roumania and South Russia are exactly similar to our own tame stock, so that it is not possible to detect with certainty the presence of visitors from other lands. Probably the nearest breeding-grounds of the wild form are some of the mosses of Jylland in Denmark, while the district of the great lakes in South Sweden is also haunted by others. The enormous extent of reed-beds in the delta of the Danube is inhabited by a fair number, as are also the marshes of East Prussia, and the flight from Sweden or Denmark to our east coast is well within the powers of a bird whose winter wanderings extend to the lakes of Algeria and Lower Egypt.

As a rule home-bred swans are unwilling to fly, and will allow a fairly close approach when unpinioned without taking to the wing, so that nearly all those which are to be seen in the summer in the British Isles, or which allow a close approach in winter, may be safely ascribed to the species *Cygnus olor* (Gmel.). It does, however, occasionally happen that the whooper has been known to become so tame, where protected, that it will come to be fed within a few yards of the spectator.[1]

[1] See the account of extraordinary tameness of whoopers on the river Eden in Cumberland in the *Ibis*, 1911, pp. 546-548.

We must therefore look for other points of difference. The carriage of the neck is very characteristic: the mute-swan's neck is gracefully curved in the shape of the letter S, while both the whooper and Bewick's swans carry the neck stiffly upright, so that a wild bird can be distinguished at a great distance by this character.

There is not much difference in size between a whooper and a mute-swan, but the third species, Bewick's swan, is decidedly smaller than either of them. Although this is obvious when the two birds are seen side by side, it is by no means easy to estimate the size of a swan on the wing half a mile away. Fortunately there are other means by which the wild birds can be identified with tolerable certainty, even at a considerable distance. The trivial name of our domesticated bird calls attention to the fact that it is practically, though not entirely, silent. It is true that the elder Naumann states that wild individuals utter a very loud, trumpet-like note, closely resembling that of the common crane, but he adds that it is not heard during flight, as is the case with both the whooper and Bewick's swans, and only very rarely from domesticated birds while swimming. As so little seems to be known with regard to this note, it is possible that Naumann may have taken the call of an unseen crane for that of the swan he was watching. With regard to the other notes, there is, however, no room for doubt. There is a "soft low voice" as described in Yarrell, rather plaintive and with little variety, but not disagreeable. Colonel Hawker printed some bars of this song in musical notation, as formed with two notes, C and the minor third (E flat), and describes how the bird kept working its head up and down as if delighted with its own performance. Naumann also distinctly states that both sexes make a sound which he writes as "*kgiurr*" or "*keiorr*," in different tones, that of the male being deeper than that of his mate.[1] An angry hissing noise is also frequently heard when the birds are disturbed at the nest, and the

[1] Evidently the same sound which Heinroth writes as "*chr*": he states that it is sometimes used in courtship, so it may possibly be the same as Yarrell's and Hawker's "songs." The alarm-note is given by him as a sharper "*chirr*."

young utter a piping-note. Lastly, when the great bird is on the wing, a creaking noise, which is not vocal, but due to friction of the quills, is audible with each wing stroke, and can be heard quite easily half a mile away, while it is distinguishable by a good ear at double that distance.[1]

Even when all these sounds are taken into consideration, the fact remains that the domestic swan is essentially a silent bird. On the other hand, both the whooper and Bewick's swan are decidedly noisy, and their loud call-notes are most exhilarating, as the herd is seen winging their way over the mud-flats of some estuary, their snow-white plumage and black feet showing up splendidly against the gloomy sky. This difference of habit is based on striking distinctions in the anatomy of the three birds. In the fourth edition of Yarrell (iv. pp. 314, 320, 321, and 329) will be found figures illustrating the windpipe and breastbones of all three species. Here it is sufficient to remark that while in the mute-swan the keel of the breastbone is single, as in most birds, and the windpipe short, in both the other species there is a cavity in the sternum, and the windpipe passes along almost the full length of it between the walls before returning, and passing upward into the body cavity, where it is connected with the lungs. There are further differences between the form of the trachea in the whooper and Bewick's swan, which are illustrated in the figures referred to.

The call-note of the whooper is generally described as a loud "*whoo-whoo*" or "*whoop, whoop*" repeated several times in succession, with a slight pause between each double call. Patten compares it to a full-toned whistle, Lilford to a bugle-call, and Naumann to the sound of a trombone. The last-named writer notes that the depth of tone is variable, and differs considerably in individuals and probably also in the sexes. He writes the sound as "*klung.*" The trumpet-like notes of a large flock, mixed with the regular swish of the great wings,

[1] Stevenson also describes a "strange yapping note" like the bark of a small dog, used to entice the young from the nest.

are very impressive. When approached in the breeding haunts one hears from both sexes a rather nasal, goose-like, alarm-note, deeper in the male bird than in the female. It is rather a weak note for such a fine bird, and is difficult to express in letters. Naumann writes it as "*kilkliih*," which conveys very little to one who has not heard it, but it does not greatly differ from the alarm-notes of the various species of geese. Hantzsch describes it better as a nasal "*A*" or "*Ang*," and a higher "*Hä*." While watching a pair in 1912 which had not yet begun to nest in a marsh in Iceland, I was much interested to hear several times a low but musical song from one bird, presumably the male. It was a phrase of about seven distinct notes, rising slightly, then falling and finally rising again. Probably this little song is only uttered during the courting season; at any rate I have failed to find any description of it in any account of the bird, and there is no hint of its existence even in Naumann's great work.[1]

Bewick's swan has also a loud call-note, which is uttered during flight at frequent intervals. In the distance the sound of an approaching herd is not unlike that of a pack of hounds, or still more closely resembles the "*honking*" notes of wild geese. It is a less musical note than that of the whooper, and though Naumann also writes it as "*klung*" is quite different to the whooper's call, and more closely approaches the sound "*tong*." C. J. Patten writes it as "*tong, tong, bong, hong, ong, ongong*," which gives some idea of the varied din of honking notes in different tones which one hears as a flock passes overhead. At the end of February 1904 a herd of forty flew over my house on their way to Swithland reservoir in Leicestershire, and all the time they were in view this continuous series of answering honks was kept up. The alarm-note is apparently a soft, goose-like "*kuck, kuck*" from the male and "*kueck, kueck*" from the female (Naumann), but of the habits and notes of this species in its breeding haunts very little is known at present.

[1] The specific name "*musicus*," applied by Bechstein to this species, seems to be particularly appropriate.

Swans: Mute-swan (red); Whooper-swan (middle); Bewick's swan

By G. E. Collins

Nominally the mute-swan is a royal bird in the British Isles, and even at the present time all the swans at liberty on the Thames are the property of the Crown or the Vintners and Dyers Companies. Every year a pilgrimage is made up the river, when the young birds of the year are caught and marked on the bill, generally in July, the process occupying about four days.[1] Although occasionally female cygnets have been known to pair and lay in their second year, the majority do not breed till their third year. After the second autumn they have lost the grey plumage of immaturity and are entirely white. In the case of the so-called Polish swan, the cygnets are white from the earliest stage, and for this and other reasons it was formerly believed to be a distinct species, but it is now generally believed to be only a white variety of the ordinary form.

A certain amount of fighting takes place between the males at this period, and in some cases stubbornly contested battles take place. E. T. Booth describes a fierce fight between two old males, which were holding one another down on the water and flogging one another with their wings, till the water was completely covered with feathers for a long distance and both were exhausted. When once paired the swan is mated for life, and at all periods of the year the two birds are to be seen together, the cob, or male bird, distinguished by his superior size and thicker neck. The choice of partners appears to take place in the autumn, and at the beginning of spring pairing takes place. At such times the plumage of the body lies flat and smooth, while the two birds approach one another and appear from a distance to place their heads together, uttering their note softly at the same time. They do not actually touch though, and presently one bird begins to dip its head into the water and raise it again, the other also following suit, and the movement being repeated dozens of times. Frequently the two birds are so close together that the male dips his head into the water over the female's neck, both

[1] For further information on the subject of swan marks, see Yarrell, 4th ed., iv. pp. 329-339; and Stevenson, *Birds of Norfolk*, iii. p. 102.

(2,532)

birds occasionally pausing to lightly brush their plumage with their heads. Meantime the hen sinks lower and lower in the water till actual pairing takes place, and almost immediately afterwards the two face one another on the water, their breasts almost touching, and the male easily distinguishable by his partially lifted but closed wings.[1] Both birds then wash and dress their plumage.[2] The nesting-habits have already been treated in the "Classified Notes," but a few points of interest may be added. A new nest is built every year, generally within a few yards of that of the previous season; and as it is generally close to the water it is liable to be washed away by a sudden flood. Many cases are, however, on record in which both sexes have worked vigorously to raise the nest when a sudden rise has taken place in the water-level and the nest has been in danger of being swamped or carried away. The eggs are not laid on consecutive days, but with an interval of a day between each, and the pen will often cover them up with loose nesting material when leaving the nest to feed. This covering is carefully removed by the cob on taking her place. As the pen will not resume her position till thoroughly dry, the cob takes charge of the eggs in the meantime, and often shows himself very reluctant to leave. Close observation shows that there is considerable variation in the time during which the pen leaves the nest to feed. Some birds will hardly leave their eggs at all, and at the end of the incubation period are little but feathers and bones; others will remain off for hours together. It is a remarkable fact that in several cases two swans have to all appearance paired in the ordinary way and settled down to the business of nesting, when it has been discovered either that a surprisingly large number of infertile eggs have been laid if both birds are pens, or that incubation is apparently taking place for short intervals only in an empty nest when both are cobs.[3] During incubation the male bird, while

[1] This attitude was erroneously taken by Naumann for the pairing position, which, however, does not differ from that of other birds.

[2] See O. Heinroth, *Beiträge zur Biologie, namentlich Ethologie u. Psychologie der Anatiden*, an excellent piece of observational work.

[3] Cf. Whitaker, *Zoologist*, 1885, p. 263; and Heinroth, *t. cit.*

guarding the neighbourhood of the nest, assumes the well-known attitude of defiance. The neck is retracted and the wings raised in the attitude technically known as "busking," with the feathers erected till the head is almost hidden. Meantime he advances towards the intruder, driving himself through the water by simultaneous strokes of both feet, and thus proceeding by short rushes. In this attitude there is a superficial resemblance to the nuptial display of the turkey, black-grouse, and great-bustard, but of course they are essentially distinct. The swan's attitude is intended to intimidate an antagonist, and is adopted by a monogamous bird in defence of his mate; while the display of the other birds appears to be a "showing off" on the part of a presumably polygamous male in order to impress the female spectators. An old male swan can at times show himself a decidedly formidable opponent, and it has been frequently stated that a blow from his wing is sufficient to break a man's arm or leg. Mr. Stevenson, however, failed to satisfy himself that any instance of the kind had actually taken place, and a record referred to by Mr. J. E. Harting is not only of American origin, but is related of another species. Mr. Kirkman tells me he was attacked by a male swan on land, and was struck several times on the leg by the bird's wing. The blows were not serious, and the incident was terminated by the simple expedient of seizing the swan by the throat and pitching it into the water, where it elected to remain. Mr. M. Woodward states, on the authority of the Abbotsbury keeper, that one man had three ribs broken by an unexpected attack from behind. On the water the bird is no doubt more dangerous, if it sees signs of fear. A vicious cob does not hesitate to attack a man, or even a boat full of people, and more than one dog has been killed outright or seriously injured in this way.

As all the young are hatched out as a rule on the same day, it is evident that the pen does not begin to incubate until the clutch is complete, for there is a period of about seven to twenty days between the laying of the first and last eggs. When the lengthy incubation

is over and the cygnets are hatched and have been induced by the parents to take to the water on the second day of their lives, both parents take charge of them. During the early stages of their life it is quite a common sight to see the young perched on the back of the female, and Yarrell states that he saw the young make use of the extended foot in order to clamber on to the old bird's back. Heinroth believes that the foot is stretched out behind in order to dry the membrane thoroughly before inserting it among the feathers for the purpose of warming it, and observes that it is only in fine weather in spring and summer, when the air is appreciably warmer than the water, that this habit is noted. Unless separated, the young birds remain with their parents till late in the autumn, and in some cases through the winter, but in the following February or March are invariably driven away by the old birds. Most of these young birds spend their second year associating with one another in companies, and in the early spring of their third year settle down to married life as soon as they can find a suitable spot for breeding.

Our knowledge of the life-history of the other species is naturally far less complete. The habits of the whooper can, however, be studied without much difficulty in its breeding haunts in Iceland and Northern Europe. Like the mute-swan it is a life-paired bird, and during the second week of April many hundreds pass over the Orkneys, heading in a NNW. direction for their breeding-grounds in Iceland, which they reach about the end of the month. The young birds appear not to breed till their third year, and at one shallow lake in lower Vatnsdalur from fifty to about a hundred of them spend the whole summer. The third year birds betake themselves to the little lochs and tarns, which are extremely numerous in some parts of Iceland, each pair as a rule monopolising one piece of water unless it happens to be a large one. The same breeding-places are resorted to year after year; and in some cases even the same nests, according to Slater, are reoccupied, becoming very solid in time, and measuring as much as a yard in height. Ordinary nests are not much more than 18 inches

from the ground. Heinroth states, from observation of captive birds, that the preliminaries to pairing in the whooper and Bewick's swan are exactly similar to those already described as performed by the mute-swan, but the two birds do not adopt the facing position afterwards. The attitude of defiance assumed by the mute-swan is also unknown, although whoopers are quarrelsome birds; and when their nesting-ground is invaded by another pair, they advance at once to attack the strangers, the male leading and the female following close behind. Slater describes how the intruders are ejected "after a good deal of trumpeting and chasing and swaggering, which is most amusing to watch."[1] In some particularly favoured spots two or three nests may be found in tolerably close proximity, but this is unusual.

The cygnets are covered with grey down, and are carefully tended by both parents for about two months, when they are able to fly. Even after this time the family is generally to be seen together, but in August the old birds are in full moult and become restless and inclined to leave their breeding-places for more retired spots, making their way on foot and by swimming towards the big lakes and the sea-coast. The whooper is a much better walker than the mute-swan and steps briskly, lifting its feet high and making good progress, while the mute-swan waddles slowly and awkwardly and is soon exhausted. Those birds which breed on the lakes far inland remain till September, when the young are capable of flight. At the end of September and in October many leave the country, chiefly females and young birds, but many old males winter in Iceland. On migration they are generally seen in small parties flying with outstretched necks in a straggling undulating line. When they alight after a long flight it is almost always in the neighbourhood of fresh water, where they can wash, one of their number acting as sentinel in the meantime. Large parties adopt the wedge formation, an old bird always acting as leader.

Much of what has been written above of the whooper is probably equally true of the smaller species, Bewick's swan, which is oftener

[1] *A Manual of the Birds of Iceland*, p. 48.

seen during the winter months in large herds. The differences in the notes of the two species have already been pointed out, and the distribution of the black and yellow on the bill is best grasped by referring to the illustrations. On the tundra of the islands of North Russia and Siberia there is but little vegetation available for nest-building but moss, and Mr. Trevor-Battye describes a nest found by him on Kolguev as a mound 2½ feet high, consisting almost entirely of this material, mixed with lichens and grass.[1] On these open plains they are often conspicuous, standing some 22 inches high. As the male bird is said to remain close to the nest while the female incubates, in all probability the incubation habits of all three birds are similar. Nine well authenticated eggs are smaller than whoopers', averaging 4·07 × 2·65 in. [103·6 × 67·3 mm.]. The duration of the incubation period is unknown. In disposition Bewick's swan is timid and gentle, and has little of the domineering and combative nature of the whooper, never molesting the smaller waterfowl, even when confined with them in a restricted space. The surface-feeding ducks in particular are apt to take advantage of the presence of the larger birds, feeding on the weeds torn up by them and lying on the surface of the water.

Both Bewick's swan and the whooper sometimes show traces of reddish-brown colouring on the head and upper neck. When chemically tested this has been shown to be due to peroxide of iron,[2] and is due to the bird feeding in water charged with iron deposits. A whooper which I watched for some time in June 1912 on a shallow pool among the hills in Iceland, had the head and neck deeply stained with peat and suspended iron, producing a most extraordinary effect at a little distance. No doubt most of this would be washed off, but the iron tends to stain the feathers permanently.

[1] Nordenskiöld gives a somewhat similar account, adding that the moss is plucked from a distance of about six feet from the nest, forming a sort of moat round it.

[2] Stevenson, *Birds of Norfolk*, iii. p. 78.

IX

PIGEON SHOOTING

By W. J. Malden

Wood-pigeons are destructive to farm crops, and constant warfare has to be kept up against them where the numbers are great, or they will soon devastate a field. They are especially destructive to clovers, vetches, peas, beans, all cabbage and other "root" crops, and at the seeding and ripening of the cereals. The wood-pigeons make excellent shooting, as they are fast on the flight and quick to swerve: moreover, they have remarkable powers of withstanding the shock from shot unless struck in an important vital. Where there are large numbers, and shooting is vigorously pursued, many birds may be found dead among trees, to which they have flown by sheer pluck and perseverance, a distance of half a mile upwards. They have a commercial value, as they are popular for culinary purposes, so that where they persist they are generally pursued. In some counties the harm they do is so great that county shoots are organised, where all and sundry go out according to programme, though for want of skill, or knowledge of where to be well placed to shoot, the bag is usually very small; in fact, when some hundreds of guns are out less than a bird to a gun is often got. As more than one hundred fall to some skilled shots in a day, especially when the harnessed live lure is used, this is a poor result. This method will be described later.

1

The features of the different kinds known collectively as wild or wood-pigeons are described in Chapter X. There are only four—the ring-dove or wood-pigeon, the stock-dove, the rock-dove, and the turtle-

dove. From the aspect of the harm done to crops the wood-pigeon or ring-dove is the most important, being most numerous, most destructive, and the biggest. The stock-dove is of next importance, and even quicker in flight and in turning than the wood-pigeon. The rock-dove has a quick flight, but is much more local than the other two, although it is met with in considerable flocks inland at times when food considerations compel it. The turtle-dove is only a summer visitant, largely a seed-eater, both of weeds and farm crops; less of green food. In the large valleys where turnip and allied seeds are grown the turtle-dove is a very destructive pest, and it is imperative to keep them down. This bird is slow when put up from the ground, but birds flying into fields from a distance acquire a very high speed and swerve like a flash, so that they are by no means easy to shoot.

The three large kinds of pigeon do harm throughout the year; the turtle-dove is not here in winter. All have long vision, and appear to be able to distinguish the flight of other pigeons at an extraordinary distance; consequently, where one kind of pigeon is making flight to a certain field others from all points of the compass assume there is food there, and fly to a common centre. They can also see if there are men in a field; and it is remarkable how quickly they will enter a field containing suitable food when men and horses leave it at meal times and other occasions: these afford good chances for a concealed man to shoot them.

They have fairly defined periods for finding their food—

1. In the spring, during which the migrants still remain, when they follow the drill during the sowing of spring corn. At this season they are active on the autumn sown tares or vetches, clovers, cabbages, and other green food; also on ivy-grown trees in search of berries, which they visit much in February and March, and such other green food as may be available.

2. Late spring and early summer. In the earlier portion they have much the same food as in early spring, but frequent mowing grass, eating the clovers, and large numbers of buttercup seeds, early peas, and, later, ripening turnip seed.

3. Later summer, including part of July (but variably according to the influence of climate on ripening), they take more to grass land, corn and seed crops, vetches and peas, receiving special attention—the birds showing rather more tendency to flock as the young birds get strong; fields in which charlock, spurrey, pansy, and other weeds have ripened. The earliest stubbles cleared, the early autumn seeding of corn crops comes with the later part of this period.

4. Late autumn: corn stubbles, clovers, cabbages, etc., freshly-sown corn fields, in woodlands seeking beech mast and acorns, and on into winter, when they will have been augmented by hordes of pigeons from the Continent, the number of which is greatly influenced by the scarcity of the food abroad.

5. The dead of the winter, when there will be little corn to be got at and food has to be obtained from the woods and green crops.

The most successful shooting is done by awaiting their coming into the field, the gunner having placed himself in some shelter from which he can shoot without having attracted attention too readily: (1) When shooting from a hut, decoys or lures being set down; as will be described, shooting to harnessed live lures is the most effective. (2) Noting flocks on the ground, and stalking them from behind hedges or in ditches as they are feeding in the adjacent field. (3) Waiting for them behind shelter in a known line of flight. (4) Shooting them in corn, clover, or root fields where the seed is recently sown. (5) When crops are big, as when ripening in harvest. (6) When visiting grass land when grass is tall. (7) When they take to certain individual trees for rest, outlook, or roosting. (8) When feeding in woods on acorns, beech mast, or pheasant feeds. (9) When visiting drinking-places.

At all times it has to be remembered that wood-pigeons are far less driven away by the noise of gun fire than by the sight of man, therefore the first principle for the shooter to observe is that he keep himself from view as far as possible: moreover, if a man goes into a shelter, the birds that have seen him enter will not come near it until birds unaware of it have settled near.

Decoys have been used from time immemorial to lure pigeons to

within shot of a man behind shelter, either dead pigeons, or those that have been stuffed, or painted wooden models being employed. These are often used with much success; but from the fact that they are stationary they are not so effective as the harnessed live lure. A wounded or sound pigeon held by a string attached to a stake driven into the ground is an inefficient lure; the bird almost inevitably goes to the extreme stretch, and lies with wings outstretched, repelling rather than attracting other pigeons, and the cruelty of thus misusing a wounded bird ought to condemn the plan sufficiently.

There is no doubt about the far greater effectiveness of the harnessed live lure. This I say, although recognising that big bags are sometimes made in other ways. I can answer for 132 killed by one gun between 2.30 p.m. and 7 p.m. with no lure at all, but with a simple bush shelter placed at the shoulder of a wood, where large numbers flighted from a wheat stubble field which had just been cleared. Equally large numbers have been shot to dead decoys. As many have been shot from individual trees to which the birds have taken a fancy, the gunner having no decoys, but merely a convenient shelter. But against these must be set the extremely many instances where the birds have been constantly visiting the field, but where the gunner has only induced a few birds to come into shot. The live lure will attract all the birds to it.

Shooting to the harnessed live lure is credited to have originated in Hertfordshire; but it has been most developed in North Beds. and Hunts., largely through the impetus given to it by Mr. Osborne Day, Mr. Sanders, and Mr. Rampley, excellent shots, who have shot almost incredible numbers, and done much to control the pests which had been so destructive in the woodland areas of their respective districts, and have been very effective over an area of many miles about them. They have observed many essential little features which greatly add to success; moreover, they have trained many others, who thus keep the pigeons under control.

Shooting to the live lure involves the use of a live pigeon harnessed in a manner which causes it no pain or discomfort: the birds are able to walk freely, and have free use of their wings, but are restricted by

a cord, under control of the gunner, to a small area of movement. The illustrations given will help to make clear the method of harnessing and mode of operation. This form of shooting makes a hut or other shelter essential. For practical purposes it should be confined to a hut; which is far preferable.

It has to be remembered how marvellously keen-sighted pigeons are; and for that matter how suspicious they are of danger. Many—practically all—who have shot from shelters must have noticed how every little movement is detected. Even in an enclosed hut, with but a few small holes only big enough to push through a gun and sight it at a sitting bird, they must have learned how cautious they have had to be in putting the gun barrel through: the slightest movement is observed, and away goes the bird. It is a principle in shooting to the harnessed lure that this extreme caution is not needed: the live lure calls attention from the man to the bird. Moreover, the incoming bird will always hang in its flight over the lure with outstretched wings, giving such an easy shot that a moderate shot can kill it. It may be mentioned, however, that the stock-dove is far more alert than the ring-dove; and is not only a quicker flier, but can break away with a marvellously quick turn, which makes it far more difficult to shoot.

2

Before going into details as to the practice of shooting to the live lure, it is advisable to make some general remarks; and many of these will be applicable to other forms of shooting from behind shelters. It has been said that wild pigeons are extremely keen sighted—and, for that matter, long sighted; further, they have to be satisfied that they can settle with safety. The pigeon's mind accepts it that where another pigeon can settle safely it can do so also; and even at a long distance they discern birds on the move. Pigeons as they feed have a habit of fluttering forward to fresh food; and incoming birds fly to them. The harnessed lure supplies this temptation to settle.

Harnessing is done with one length of tape or string. Take 3 to

4 feet of this, double it into equal lengths, and at the middle make a secure loop about an inch long; then lower down, about 4 inches, make another secure knot, forming a second loop. Take the pigeon and slip its head through the long loop, with the short loop on its back. Fit the big loop so that it fits over the crop, and comes close up to the body: the knot of the long loop will be about an inch behind the setting-on of the neck, at the back of the bird. It is convenient then to turn the bird rather on its back, taking care to hold the back knot in its place along the spine. Pass one of the loose ends of the string behind the leg on that side and bring it up to the small loop, and firmly secure it there: in practice it is not as a rule advisable to draw this string too tight. Then pass the other string under the other leg, and tie that also in the small loop. The bird is now harnessed; being, as it were, coupled fore and aft. It is in a sort of cradle, and cannot escape forward because of the wings, nor backward because of the legs. If held up at the tie in the small loop it should hang in perfect balance.

The pull cord is fixed to the harness where the strings meet at the small loop. It is convenient to fasten at this point a small ring such as is used on leggings, about half an inch in diameter. If a small hook, closed by a spring, after the manner of those found on watch chains, is used at the end of the pull cord, it will be found convenient for hitching and unhitching.

The pull cord should be a fairly strong fishing-line, and a common quality brown line is far better than one of good quality, for such a one will not stretch, whereas one of good quality springs considerably. Having harnessed the bird and attached the pull cord, it is necessary to contrive to hold the bird in the right position, and not let it stray; and it is also essential that with a slight pull on the string the bird is lifted off the ground a few inches to cause it to flutter its wings to attract the incoming birds. Some shooters will put out two or three lures, and make the birds rise at once or alternately. To effect this, a stick about 4 feet long with a crutched top should be driven into the ground securely, and should lean away from the shooter's hut, being firmly fixed with top end from 20 inches to 2 feet above ground. The reason for this tipping

is to prevent the bird from running round the stick and getting wound up to it. A piece of string should be tied across the top of the crutch so that the string does not jerk out. However, those who do much shooting use an iron rod, with flattened, sharpened end, so that it can be driven into the hardest ground: this is provided with an eyelet through which the cord is passed. This is set up about 25 yards from the hut.

The loose end of the string is carried into the hut and tied up, allowing such length as to let the bird walk round in a circle of about 18 inches in diameter. A slight pull on the string will lift the bird just clear of the ground; its wings will then flutter, and it will rise from the ground quite naturally.

The position of the hut is an important matter. Unless prevented by exceptional conditions, the hut should be placed with the lure down-wind. Long flight pigeons, in the main, enter a field down-wind; or if from another, turn up-wind to settle. (See illustration, p. 300.) Birds coming down-wind will miss inanimate decoys, as there is no movement to attract their attention. Those who have sat much for pigeons in shelters in hedgerows must recall how often the pigeon has come in from behind, missed sighting the dead decoys, and flown to some other part of the field. But they practically never miss a moving one; and certainly not one made to rise and fall, fluttering its wings. The fluttering bird calls attention to itself; and the incoming birds, after passing over, will turn and beat up-wind, coming down slowly to settle, or inquiringly, and so, making a hover over the bird, affording a most simple shot.

However, it is not usual to be restricted to the live lure; it is well to have some dead pigeons or wooden dummies set quite near to them. When using recently killed pigeons to set up, the skin should be pulled from over the eyes to allow them to shine. The incoming birds, allured by the living lure, are puzzled by the inanimate lures, but cannot keep attention off the live one, and fly inquisitively, arresting their flight when over the lure, and affording a most easy shot. Freshly killed birds set up naturally with a stick down the throat and through the

crop to support the head are much more attractive than stuffed birds, for they retain the natural bloom and colour.

Another important point in connection with the harnessed lure is that, owing to its attraction, the incomer's attention is withdrawn from the gunner in the hut; and a far greater opening, allowing much freedom in shooting, is possible—though too much licence must not be taken of this, for the birds are quick to detect movement, and break away quickly. The hut should be as dark as possible, with no through light.

The essentials of a hut are that there should be room for free movement, that unnecessary openings be avoided, and that it should be comfortable, for men often require to remain in it for many hours. Some when shooting to the harnessed lure prefer to shoot sitting low, others at standing height; but for convenience there should be a seat. Whichever is adopted, the bottom of the opening should be on a level with the shoulder. Birds are but little shy of huts, provided no one is seen in them; and there is no restriction as to the form or nature of the material used. An excellent one can be made where there is a hedge with a bank, from which a small semicircular piece may be cut out, and the hut be built about it. As to material, well-leaved branches, sheep hurdles used double with straw stuffed between, or anything that will obstruct light from entering suffices.

When there is a high crop on the ground it is a good plan to mow out a fair-sized patch so that the lures may be seen more readily. When shooting to the live lure at a short distance, No. 5 is an excellent size of shot.

3

Big bags are got by shooting the birds from trees in woods, and from individual ones. Wood-pigeons have a special liking for individual trees, which may or may not be near to their food, but which they use as outlooks or for rest after feeding. There may be a dozen trees practically similar, but often they will settle on only two or three in any number.

Where there is such a tree the shooting is very simple, an efficient hut being all that is necessary; though if a live lure is put down it will cause many birds to settle which otherwise would pass on. In tree shooting stuffed birds may be used; but they should be stuffed in perching attitude. Naturally they are best visible on the thin outside branches; but it is not always safe to get on to these to place the birds. A long pole can be used, with the bird set on it; but with a high tree it is not easy to place them. The best pole for the purpose is a long bamboo. Chimney-sweepers' rods have been used, but they are too heavy for their flexibility, and bend over and are of little use.

Shooting from trees in woodlands, choosing trees where the birds are known to settle frequently both during the day or for evening shooting, gives opportunities for killing large numbers if suitable shelter is provided; and it may be noted in respect to evening shelter that the pigeons go to roost early, so that if driven away they return again and again. This shooting is most effective whilst the trees are bare—or, at any rate, not in heavy leaf—for usually these birds are shot whilst perching: though a good shot may get them when flying. The birds often take to a group of trees; and it is a good plan to discover which are the favourites. Often a hut can be arranged to cover three or four trees. Experience shows that in wood shooting, especially if there is underwood, No. 4 shot is better than No. 5 at sitting birds at fairly long range, for with this the birds drop straight out of the trees; whilst with equally good shooting the poorer penetration of No. 5 allows the birds to fly some distance, and it is difficult to find them. In short underwood good overhead shooting can be got at birds coming over. A good many pigeons may be shot on the pheasant feeds, though this is rather alarming to the pheasants. In woodlands the habits of the birds have to be studied closely in respect to the perching trees, feeding patches, flighting, etc.; and it is a good plan to have a considerable number of shelters or huts more or less permanently set up so that as they get nervous of one place the gunner can go to another. It often pays to make this change several times in a day or evening, and as one moves odd birds will often provide shots.

Good shooting is often got at the outskirts of the woods, when a slight shelter of boughs gives a good chance at coming-in birds. There is no better pigeon shooting than this, and observation will soon show where the best stands are.

Those who follow pigeon shooting systematically make a point of opening the crops of birds to ascertain on what food they have been feeding. Probably they have a fair knowledge of the cropping on any line from which the birds have come for two or three miles; but sometimes they flight longer distances, and a run on a car, or inquiring among farmers at market, will generally elicit information as to where any particular field lies, and with what frequency the birds visit it. If report is sufficiently attractive—that is, if it suggests thirty or more birds a day—it should be worth while putting up a hut from which to shoot the birds in the field of which this good news is told.

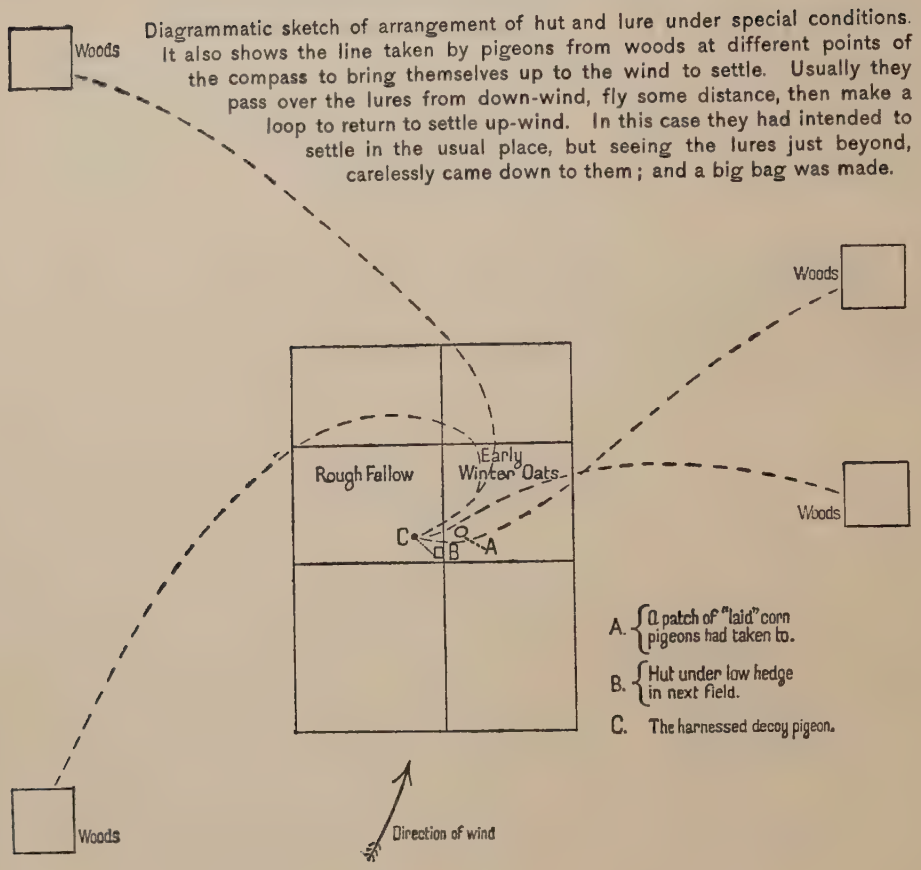
On days of moderate length pigeons usually have three principal feeding times, though these may be somewhat altered by disturbances; and during the spring seeding and summer there are more casual or individual flights. In the long summer days flocks will make four feeds. The usual feeding times are at break of day, about midday, and afternoon; but they do not feed much after sundown except in the depth of winter, when they feed a little later in view of the long night ahead. There is no doubt that there is advantage in several guns being out in a district in fields the birds have taken to, for then they have less chance of satisfying their appetites and are kept well on the move. Birds will often not trouble to go back to trees to roost in hot weather, preferring to sit out on rough clods. This can be turned to account, as, if the decoys are set out on the fallow, fewer birds will fall in the standing corn.

The ring-dove or wood-pigeon makes the best lure of any kind of pigeon, as it is large and its colour is most attractive. Moreover, it is a lively bird: it will call a turtle-dove as readily as a stock-dove; but any pigeon is attracted by one of another variety provided it can see it, and turtle-doves making flights to a field will draw any of the others to it. Live decoys can be taken from the nest and be kept

enclosed, or they may be taken on pheasant feeds in the ordinary wooden cage trap. Occasionally a bird may have its extreme pinion broken, and not be able to rise. If it is caught, the wound dressed, and an antiseptic used, it will be well again in a day or two, and really suffers nothing. To get wild birds to feed it is best to place them in a cage in a quiet place, put in a supply of peas, ample clean water, and leave them undisturbed for two or three days. At first they refuse food, but hunger drives ; and when once they have taken food they give no further trouble.

Reference has been made chiefly to the ring-dove because what is applicable to it is also applicable to the other doves. All kinds are apt to flock at times, though the turtle-dove does so less than the others.

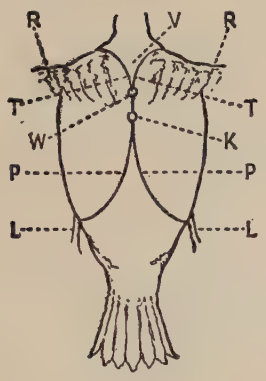
A SUCCESSFUL DAY'S SHOOTING



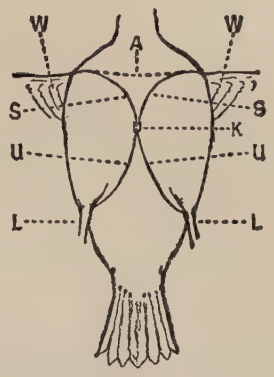
Diagrammatic sketch of arrangement of hut and lure under special conditions. It also shows the line taken by pigeons from woods at different points of the compass to bring themselves up to the wind to settle. Usually they pass over the lures from down-wind, fly some distance, then make a loop to return to settle up-wind. In this case they had intended to settle in the usual place, but seeing the lures just beyond, carelessly came down to them; and a big bag was made.

In a very successful day's shooting, a field with four woods, variously from 1 mile to 1½ miles away, did not present a good place in a field of early winter oats for a hut, without the shot birds falling into the standing corn, where they would be difficult to find. Near the centre fence, about ¼ acre had been storm broken and laid flat; here the pigeons came in great numbers from the several woods. The adjoining field was in a rough fallow. To take advantage of this, and also to have the wind at the back, the hut was placed nearly in the corner; the decoys being set out on the rough clods. The pigeons coming to the patch and finding more feeding there swing over it; caught sight of the decoys, and came down to them. Observation was kept as to the method of approach from the several woods, and it was seen that almost invariably the flight was as shown by the dotted lines.

DIAGRAMMATIC VIEWS OF HARNESSING



BACK

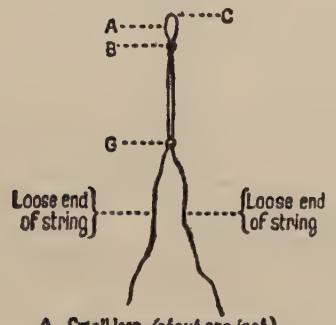


UNDERSIDE

V. Angle made by union of wings.
R. Wings.
T. Over shoulder strings.
W. Knot of big loop.
K. Knot of small loop carries ring by which bird is held: *it is here that both strings from below are tied.*
P. Under-leg strings.
L. Legs.

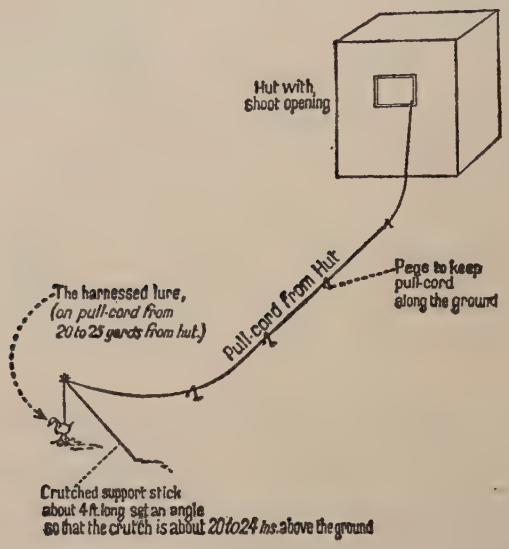
A. Breast Bone.
W. Wings.
S. Over shoulder Strings.
K. Knot.
U. Under-leg Strings.
L. Legs.

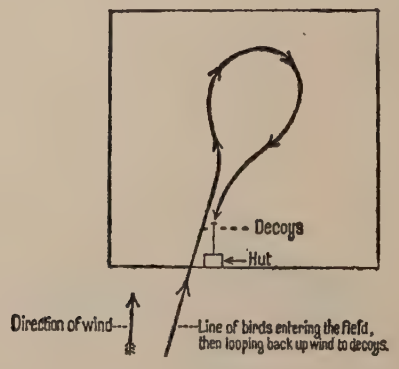
STRING



A. Small loop *(about one inch)*
B. Knot
C. End small loop, where strings are tied.
G. Knot of big loop, *about 4 inches long.* The head of the bird is thrust through this loop B *to* G. G being brought under the crop. Small loop thus on the back.

DIAGRAMMATIC SKETCH OF HUT AND HARNESSED LURE


Hut with shoot opening
Pegs to keep pull-cord along the ground
Pull-cord from Hut
The harnessed lure, (on pull-cord from 20 to 25 yards from hut.)
Crutched support stick about 4 ft. long set an angle so that the crutch is about 20 to 24 ins. above the ground



A common flight for pigeons flying down-wind. On seeing decoys continue flight, gradually bearing to one side, then looping, so that they return to the decoys up-wind.

X

NATURAL HISTORY OF THE PIGEONS

PRELIMINARY CLASSIFIED NOTES

[F. C. R. JOURDAIN. W. P. PYCRAFT. A. L. THOMSON]

WOOD-PIGEON [*Columba palumbus* (Linnæus). Ring-dove, cushat, queest, woodie; cushie doo (Scotland). French, *colombe ramier*; German, *Ringeltaube*; Italian, *colombaccio*].

1. Description.—The wood-pigeon is readily distinguished from all its congeners, not only by its much larger size, but also by the large patch of white on the neck, and the broad band of white which runs across the extended wing transversely to its long axis. Length 16 in. [406·4 mm.]. The sexes are alike. (Pl. XXXI.) The head and neck are bluish grey glossed with metallic green and lilac; the side of the neck marked by a large patch of creamy white. The back and wings are of a bluish lead colour, the greater wing-coverts are blackish. Across the extended wing, from the region of the wrist joint, runs a broad white bar, transversely to the long axis of the extended wing; the anterior margin of the wrist joint is also white. The under parts from the throat to the breast are vinous, with the abdomen, flanks, and under tail-coverts pale bluish grey. The beak is orange-red at the base, yellow towards the tip, the cere white; the legs and toes are red, and the iris is straw-yellow. The female is somewhat smaller and duller than the male. The juvenile plumage differs from that of the adults in being duller and paler, tinged with brown, and lacking the white patch on the neck. The beak is dull red at the base, the rest greyish. The nestling is sparsely covered with yellowish, hair-like down. [W. P. P.]

2. Distribution.—During the breeding season this species is generally distributed through all the wooded portions of Europe (except in Scandinavia and Russia north of lat. 65°-66° N.), as well as in Asia Minor, while other subspecific

forms are found in the Azores, Madeira, and North-western Africa. In the British Isles it is a well-known resident in practically the whole of Great Britain and Ireland, except in treeless districts, but it has bred occasionally in small numbers even on the Outer Hebrides and the Orkneys. Birds from Northern Europe are migratory, and have their winter quarters in our islands and in Central and Southern Europe as well as North Africa, but the migration limits of this species appear to extend no farther than its most southerly breeding range. [F. C. R. J.]

3. **Migration.**—A resident, and a winter visitor in greatly varying numbers. There is no evidence of any movement on the part of our resident birds, but they may possibly migrate to some extent within our area, seeing that such movements might well be indistinguishable from the subsequent wanderings of Continental immigrants. The immigration referred to takes place on the east coast of Great Britain, the Shetland Isles being visited by some of the migrants. The extent of the immigration varies greatly from year to year, but at its maximum it affects the greater part of our area, the species' numbers in Ireland, for instance, then receiving large additions. As a rule, the birds first arrive in the British Isles late in October or early in November, and their numbers are increased during the latter month; by the end of January a decrease may already have set in, and the majority leave in February (cf. C. B. Ticehurst, *British Birds*, ii. p. 72; and others). What has been said of the immigrants in Ireland is true of our area as a whole, namely, that they "vary as to the localities they visit, the time they remain, and the seasons in which they occur, being doubtless influenced by the rigour of the weather in the countries whence they come, and also by the abundance of beechmast and other food here" (Ussher and Warren, *B. of Ireland*, 1900, p. 222). Seasons in which great immigrations have occurred are 1881, 1884 (especially: cf. *British Association Migration Reports*, vi. p. 59), 1889, 1894, 1899, 1901 (cf. Nelson, *B. of Yorks.*, 1907, p. 488), and 1907 (cf. C. B. Ticehurst, *loc. cit.*). A markedly gregarious bird on migration and in the winter months generally: in seasons such as those just named enormous flocks occur. [A. L. T.]

4. **Nest and Eggs.**—When built by the birds themselves, the nest is placed in tall hedges or trees of all kinds at varying heights, but generally at a fair distance above the ground, and is a flimsy erection of twigs, through which the eggs can often be seen. (Pl. xxx.) But many nests are made upon old squirrel dreys or nests of other birds, and it is not uncommon to find it breeding in ivy, on trees, walls, or cliffs. It has also been known to build exceptionally on or quite close to the ground, in heather or bracken, under boughs, etc. (cf. H. F. Witherby, *Zoologist*,

1895, p. 232, and also p. 275; *Annals of Scottish Natural History*, 1901, p. 236), while in towns it has nested on a window ledge (see *Field*, 7th May 1904). Material for building is contributed by both sexes according to Naumann, but the work of construction is performed by the hen. The eggs are generally two only, but instances of three in a nest are occasionally recorded, while the rare instances in which four eggs have been found in a nest probably represent the first and second layings of one hen, or the produce of a second bird when the first has been killed (see *Zoologist*, 1889, p. 436; *British Birds*, iv. pp. 155 and 316). They are a pure white, with no trace of cream, and are decidedly glossy. Saunders states that they are laid at intervals of two or three days. Average size of 40 eggs, 1·68 × 1·15 in. [40·8 × 29·3 mm.]. Incubation is shared by the sexes, and lasts about 17 days, the male as a rule sitting in the daytime, according to Saunders. Breeding generally begins about the first week of April, but nests have been recorded even in January and February (*Zoologist*, 1874, p. 3998), as well as March; and as fresh eggs may be found till October and even early in November, it is obvious that two or three broods are often reared in a season. [F. C. R. J.]

5. Food.—Grain, peas, beechmast, acorns, hazel-nuts, berries, leaves of clover, turnips, etc. [W. P. P.]

6. Song Period.—The cooing notes are heard "occasionally in January and February, and regularly from March to the beginning of October" (*British Birds*, iv. 276. C. J. and H. G. Alexander). [W. P. P.]

STOCK-DOVE [*Columba œnas* Linnæus. Blue-rock, sand-, or hill-pigeon, culver. French, *colombe*; German, *Hohltaube*; Italian, *columbaccio*].

1. Description.—The stock-dove is readily distinguished from its congeners, having no white in the plumage, and two imperfect black bars across the wing. (Pl. XXXIII.) Length 13½ in. [342·90 mm.]. The sexes are alike. The upper parts are of a darker hue than in the rock-dove, the head, neck, scapulars and interscapulars being of a light slate-grey, the wing-coverts paler, and the rump pale bluish grey. On the side of the neck is a patch of iridescent, metallic green, with purplish red reflections. The innermost major coverts have a black spot partially overlapped by the median coverts, and the innermost secondaries have similar patches of black. The primaries are of a dark slate-grey with a whitish line along the fore edge of the outer web. The tail is light grey shading into black over the terminal portion. The throat, fore-neck, and breast have a vinous hue, the rest of the under parts are

grey. The cere is red, the iris dark brown. The legs and toes are pinkish red. The female is slightly smaller and duller. The juvenile (teleoptyle) plumage resembles that of the adults, but lacks the metallic reflections on the neck, while the black patches on the wings are barely traceable. [W. P. P.]

2. Distribution.—In the British Isles this species is somewhat local, but not uncommon in England and Wales, while in Scotland it has greatly extended its range of late years, and now not only breeds on the Moray and Dornoch Firths, but is also found in Sutherland and W. Ross, and has even occurred in the Orkneys and Shetlands (see *Ann. Scot. Nat. Hist.*, 1894, p. 3; 1896, p. 253; 1909, p. 115, etc.). It breeds in the Isle of Man, and is now resident in small numbers in Ireland and increasing its range, which, according to Mr. Ussher, has been extended through eastern Ulster and Leinster to Lough Derg (1896), S. Wexford (1900), and Athlone (1902). On the Continent it is found in Southern Scandinavia, in Russia up to 61° 40′ in Finland and 56½° in the Urals, sporadically in Central Europe, south to Portugal, North Italy, North-West Africa, Montenegro, Rumelia, and the Danube valley, while apparently its range extends also into Transcaspia, but farther east it is replaced by the Eastern form, which ranges to Krasnoyarsk. In the southern part of its range it is a resident, but in Northern Europe it migrates southward during the winter months, and visits the Mediterranean region, while the Eastern race winters in India. [F. C. R. J.]

3. Migration.—Chiefly resident within our area, but probably also a winter visitor to a slight extent. "As a rule it leaves the northern portions of our islands in October and returns in March" (Saunders, *Ill. Man. B. B.*, 2nd ed., 1899, p. 482), but over a great part of our area it is not known except as a resident and more or less stationary species. On the east coast of Great Britain a slight autumn immigration from the Continent is sometimes observable (cf. *British Association Migration Reports*, v. p. 50; and Nelson, *B. of Yorks.*, 1907, p. 492). Gregarious on migration, and generally in winter, but seldom reported in flocks of very great size. [A. L. T.]

4. Nest and Eggs.—The nesting-site is almost always in a hole of some kind, very often in a pollarded tree or natural hollow, also in crevices of rocks, in rabbit-burrows among sandhills, in ruins or thick ivy, in nesting-boxes, under thick furze bushes, and occasionally in old squirrels' dreys or magpies' nests. It has also been known to breed among heather on a steep hillside, and where suitable holes were not available, on a ledge of a cliff, partly supported by brushwood. In most cases little or no nesting material is used, but instances are on record

Photo by F. E. Daniel

Ring-dove's nest

Photo by F. E. Daniel

Stock-dove's nest in a sandhill

Photo by Riley Fortune

Stock-dove's nest-hole in a cliff

Photo by Riley Fortune

Turtle-dove's nest

in which fresh and green leaves of laurel, horse-chesnut, etc., have been found in the nest. (Pl. xxx.) The eggs are two in number as a rule, but three have been recorded several times (cf. *Zoologist*, 1876, p. 4875; 1880, p. 143; 1888, p. 393: *British Birds*, iv. p. 155, etc.). They are creamy-white in colour, more rounded in shape in most cases than those of the ring-dove, and tolerably glossy. Average size of 41 eggs, 1·53 × 1·13 in. [39·1 × 28·8 mm.]. Eggs may be found from the beginning of March till the first half of October, so that probably two or three broods are reared in the season, but as a rule the first clutches may be found in April. The period of incubation is given by Naumann as 17 to 18 days, and he states that both sexes take part in incubation, the male relieving his mate from 9 or 10 A.M. to 3 or 4 P.M., and, like her, sitting very closely. [F. C. R. J.]

5. Food.—Chiefly grain, seeds of various weeds, acorns, beechmast, and berries. [W. P. P.]

6. Song Period.—The "cooing" notes are heard chiefly during the courting and nesting period. "It sings later in the autumn than the wood-pigeon" (*British Birds*, iv. 276. C. J. and H. G. Alexander).

ROCK-DOVE [*Columba livia* Gmelin. Cliff culver, doo (Shetlands), wild pigeon. French, *colombe biset*; German, *Felsentaube*; Italian, *piccione selvatica*].

1. Description.—The rock-dove may be distinguished at a glance by the large patch of white on the rump, and the two black bars across the wings. The sexes are alike. (Pl. xxxii.) Length 13·50 in. [342·89 mm.]. The head and neck are conspicuously darker than the rest of the plumage and of a dark bluish grey, with a patch of metallic, iridescent green on the neck. The rest of the plumage is of a light blue-grey, the remiges dark slate colour. Tail dark blue-grey, shading into a black terminal bar, and having the outer webs of the outermost pair of feathers white. The two black bars across the wings and the white rump are conspicuous, and scarcely less so, during flight, are the white axillaries and under wing-coverts. The juvenile plumage is duller and lacks the metallic patch on the neck. [W. P. P.]

2. Distribution.—In the British Isles this species is chiefly confined to those parts of the coast where broken cliffs and sea-caves are found, and is consequently absent from the east coast of England south of the Spurn, and on the south is only of rare occurrence in the Devonian peninsula. It is found on the

Welsh coast, the Isle of Man, and Cumberland, while on the west coast and islands of Scotland, as well as on the Irish coast (especially on the western side), it is extremely common. In some places domestic pigeons which have reverted to a wild state have joined the colonies of wild birds. Besides the Orkneys and Shetlands, it is also found on the Færoes, but is now apparently extinct in Scandinavia. It is scarce in the Pyrenees, but occurs in S. Spain and Portugal, the Canaries, Azores, Madeira, the Cape Verde Isles, while in the Mediterranean region it is found in the Balearic Isles, Corsica, Sardinia, Italy, Sicily, Malta, the Balkan Peninsula and the Greek islands, Crete, North-west Africa, Cyprus, and also in the Crimea and Asia Minor, while allied forms occur in Senegal, North-east Africa and Arabia, and Asia generally from S. Persia to China and Japan. Throughout its range this species is resident. [F. C. R. J.]

3. Migration.—Resident and stationary: there is no evidence of the existence of any migratory habits in the species. [A. L. T.]

4. Nest and Eggs.—The usual site is on a ledge or in a crevice in a sea-cave, and often several pairs may be found breeding within a short distance of one another. In default of caves the rock-dove will nest in almost any deep crevice, and in the Mediterranean region has been known to nest in ruins, and even in the sides of deep wells; but in the British Isles it does not breed in the neighbourhood of human dwellings, and records from cliffs inland appear to refer to escaped pigeons which have reverted to the primitive type. The actual nest is a flimsy structure of grasses, twigs, roots, heather, or sometimes seaweed, and contains two white eggs. (Pl. XXXII.) Average size of 63 eggs, 1·54 × 1·15 in. [39·2 × 29·3 mm.]. The breeding season is very prolonged, and several broods are reared. In the Shetlands, Saxby states that it breeds practically all the year round, and that where there is a sufficiency of food incubation is constantly in progress from the end of February to the end of October. He also found an almost perfect egg in the ovary of a hen on 21st January, but as a rule most eggs are found between April and August. Incubation, as observed in confinement by Mr. J. L. Bonhote, lasts 19 days, and Saxby notes that it is chiefly performed by the hen, who is fed on the nest by her mate, and occasionally relieved by him for a short period. [F. C. R. J.]

5. Food.—Grain, seeds, and roots of noxious weeds. [W. P. P.]

6. Song Period.—The bird is most vociferous during the breeding season. [W. P. P.]

TURTLE-DOVE [*Turtur turtur* (Linnæus); *Turtur communis*, Selby. French, *tourterelle*; German, *Turteltaube*; Italian, *tortola*].

1. **Description.**—The turtle-dove differs conspicuously from its congeners, having the upper parts variegated with cinnamon-brown and black, and a patch of black and white on the side of the neck. The sexes are alike. (Pl. xxxiv.) Length 11·25 in. [285·75 mm.]. The head and neck are of a pale bluish ash colour, the latter with a patch of black feathers tipped with white on each side. The wing-coverts and scapulars have broad margins of cinnamon-brown, the centre of the feathers being black. The rump is of a dark bluish grey, the feathers along the centre of this area obscured by broad margins of dull yellowish. The primaries are dark slate colour, with a narrow fringe of dull white along the outer vanes. The centre tail feathers are dusky brown with whitish tips, the rest black, with a broad terminal bar of white; the outer feathers with white outer webs. The throat and fore-neck are of a pale vinous hue deepening in the breast, while the abdomen and under tail-coverts are white. Around the eye is a circle of bare red skin, the iris is reddish brown, and the feet are red. The female resembles the male, but is duller. The juvenile dress differs from that of the adult in being altogether duller, and lacking the black and white patch on the neck, while the under parts are of a dull ash colour with a wash of fulvous brown. [W. P. P.]

2. **Distribution.**—A regular summer migrant to the southern part of Great Britain, but scarce along the western counties of England and Wales (Cornwall, Pembroke, Carnarvon, etc.), and has only been recorded as nesting on a few occasions in the northern counties (Northumberland, Cumberland, and Durham), though a few pairs probably breed in south Scotland. On the Continent it is rare in Scandinavia and Northern Russia, but is distributed over the rest of Europe as well as South-western Asia, while it is replaced by allied subspecific forms in North Africa and other parts of Asia. Its winter haunts are in Northern Africa, and it has occurred as far south as Abyssinia. [F. C. R. J.]

3. **Migration.**—A summer visitor. The extent of its British breeding area is indicated in the preceding paragraph: outside this the turtle-dove occurs as a bird of passage or as an irregular visitor. Thus its migrations only occasionally extend to the northern and western isles of Scotland, but Ireland is regularly visited on both passages, pairs occasionally remaining to nest (cf. Saunders, *Ill. Man. B. B.*, 2nd ed., 1899, pp. 485-486; Witherby and Ticehurst, *British Birds*, ii. pp. 125, 126;

and Ussher and Warren, *B. of Ireland*, 1900, p. 226). The immigration of the English summer visitant birds begins at the end of April or the beginning of May, continuing throughout the greater part of the latter month (cf. Ticehurst, *B. of Kent*, 1909, p. 380). In some seasons the immigration is noted as occurring almost solely on the shores of the south-eastern counties, in others along the whole south coast, " but first and chiefly on its eastern half " (cf. *B. O. C. Migration Reports*). The spring immigration into Ireland takes place on the coasts of Wexford and other south-eastern counties, and from these the movement spreads through the southern portion of Ireland, even to its south-western extremity; the subsequent emigration through the more northerly parts has not been studied in detail (cf. Ussher and Warren, *loc. cit.*; and Ussher, *Irish Naturalist*, 1909, p. 184). Some departures take place from Great Britain as early as August (cf. Ticehurst, *loc. cit.*), but September is the chief month of emigration. A small proportion linger still later, but such records of late birds as those at Lerwick, 4th December 1905 (cf. Paterson, *Ann. Scot. Nat. Hist.*, 1906, p. 199), and Penrith, 21st December 1894 (cf. Saunders, *loc. cit.*), must be regarded as purely exceptional. The turtle-dove is usually reported, as a migrant, as observed in pairs or small companies. [A. L. T.]

4. Nest and Eggs.—The usual site for the nest of this species is among the branches of a tree or in a straggling hedgerow, sometimes only a foot or two from the ground, and at other times 10 or 15 feet above it, but generally rather low down. Exceptionally it has been known to breed in squirrels' dreys (*Zoologist*, 1892, p. 310) and old nests of the rook (H. S. Davenport in Saunders' *Manual*, 2nd ed., p. 486). The nest is a very flimsy construction in most cases, and generally the outline of the eggs is plainly visible through the nest from below. It is built of a few fine twigs carelessly laid together, the materials being brought by both birds, but the actual building by the hen (Naumann). In some cases buttercup flower-stalks have been found as lining (*Zoologist*, 1907, p. 326). The eggs are two in number, white, with a very slight tinge of cream, rather elongated in shape, and somewhat pointed at one end. Average size of 26 eggs, 1·18 × ·88 in. [30·1 × 22·4 mm.]. Incubation lasts for 13-14 days according to Mr. J. L. Bonhote, who has bred this species in captivity, and the duty is shared by both parents. The usual breeding season in England begins during the last week or two of May and early in June, while it is probable that a second brood is frequently reared, as fresh eggs may be found at the end of July and the beginning of August. [F. C. R. J.]

5. Food.—Grain, small seeds, berries, small mollusca. [W. P. P.]

6. Song Period.—"Irregularly for a week after arrival, and then regularly to the beginning of August." Irregularly later. It has been heard as late as August 23. (*British Birds*, iv. 276. C. J. and H. G. Alexander.) [W. P. P.]

1. THE PIGEONS

[W. P. Pycraft]

Though the term "amphibious" is by common consent and usage restricted to those creatures which lead a double life, alternately on land and in the water, it might, with hardly less cogency, be applied to birds like the pigeons, for, as the most casual survey of their habits and general conformation shows, they too lead a divided life, alternately between lofty perches and the ground. Speaking broadly, they must be regarded as arboreal birds, though some never at any time in their lives seek harbourage amid trees, but spend their lives amid crags and beetling cliffs. But by the shortness of their legs it is obvious they are not ground dwellers. Some, however, have become so, and in these, be it noted, the legs are long, as in the great crowned pigeons, the Nicobar pigeon, the *Otidiphaps*, and the extinct dodo and solitaire, for instance. Their relationship to the plover-tribe is, externally, indicated in nothing but the form of the beak, which presents but little variation in shape, the tooth-billed pigeon (*Didunculus*) and the white-fronted ground-pigeon (*Henicophaps albifrons*) departing most markedly from the type in developing more massive jaws. They differ conspicuously from their relations, the plovers, in that their eggs, which never exceed two in number, are always white, and in that the young are but scantily clothed, emerging from the shell, indeed, naked, and with sealed eyelids, and remain long helpless in the nest, which is at best but an indifferently constructed platform of sticks.

The method of feeding the young is peculiar, since the nestling thrusts its beak within the mouth of the parent, who pumps up from the crop a milky fluid, secreted by the walls thereof, which are richly supplied with blood-vessels, as also is the skin immediately

surrounding the crop. The fluid is apparently sucked up by the young, and doubtless the great width and swollen margins of the lower jaw, at its base, considerably aid in this method of feeding.

The excrement of young pigeons, according to Seebohm,[1] is of a peculiar nature and without smell, so that it is never removed from the nest, and soon hardens on exposure to the air, thus converting the fragile, loosely constructed platform of sticks into a durable structure.

Of the 450 known species but four are to be reckoned among our native birds, and these represent two of the most typical genera; but many exotic species are conspicuous for the remarkable beauty of this coloration.

Since the eggs are laid in an open nest, it is somewhat remarkable that their shells should be white, all other birds which lay white eggs depositing them in holes, and, it has been assumed, for the sake of concealment. To explain the fact that species like the wood-pigeon and turtle-dove seek no such concealment, it has been contended that with these birds the whiteness of the shell is their protection, since the nest is so flimsy that light is readily seen through its interstices when the structure is seen from below, and this being so, the white shells become indistinguishable from flecks of light! As a matter of fact, the eggs seen from such a standpoint would appear black. Further, even if it were otherwise, it would afford no protection against the only foes that need be dreaded—those which can climb, or surmount the nest—squirrels and egg-eating birds. These can have but small difficulty in finding such quarry, at any rate with the early clutches laid before the leaves are fully out. Later a measure of protection is afforded by overhanging foliage. But it is clear that though the risk of destruction to which such eggs are exposed is considerable, the annual losses by the community cannot be heavy, or these birds would either have become extinct or they would have reverted to the ancestral habit of breeding in holes and caverns, like the rock-dove and stock-

[1] Seebohm, *British Birds*, vol. ii. p. 397.

dove. In short, it is because the wood-pigeon and turtle-dove are descended from hole-nesting ancestors that their eggs are white, the fact that they continue to lay white eggs shows that the lack of colour is no serious handicap in the struggle for existence.

These birds, like the parrots, kingfishers, and the host of other species which lay white eggs in holes, do so, not as Wallace contended, to conceal their eggs, but because they lay in holes. Such were probably the chosen sites of the primitive birds, and whiteness was absolutely necessary in order that the eggs should be visible, even if imperfectly, in the dim light which found entrance to the nest-chamber from the entrance hole. Without such guide the eggs would almost inevitably get broken before the incubation period was over, when the bird entered the nest to brood. Coloured shells appeared when such brood-chambers were exchanged for open nests, either to serve as a protective mantle, as in the case of the plovers, for instance, or possibly, as I have already suggested, to serve as a protection against excessive light. The fact, however, that ostriches and rheas, among struthious birds, lay whitish or creamy eggs which are often exposed for some time to the burning sun, militates, it must be admitted, against this idea that a light-screen is necessary.

A point in regard to the feathers of pigeons demands notice here. Some time ago I drew attention to the fact that if a feather of one of these birds be pressed upon, or squeezed between plates of glass, a perfect image of the feather, in the form of a pale blue film, remains. This film is formed by a waxy substance akin to that given off by "powder-down" feathers or "filo-plumes," such as are met with in the herons, for instance. So far, however, no one has succeeded in discovering the origin of this filmy matter, or what purpose it serves, but to it must be ascribed the "bloom" which pervades the plumage of these birds when alive.

Ring-dove courting

By A. W. Seaby

2. THE WOOD-PIGEON

[W. P. Pycraft]

Of our native pigeons the wood-pigeon is undoubtedly the best known, as it is also the most numerous and the largest. In the open country one of the most wary and suspicious of birds, yet wherever amid cities large open spaces with an abundance of trees are to be met with, there the wood-pigeon takes up its abode, and loses at once its fear and dread of man: no others of our native birds display quite such trustfulness, though the sparrow and the water-hen run it very close in this respect. In the gardens of the Tuilleries years ago I witnessed—and others, perchance, may have the same good fortune to-day—a most interesting instance of the wonderful tameness which these birds may display while enjoying their full liberty, for "wild" birds they could hardly be called. In this particular case a man had long accustomed them to expect his appearance at a certain time during the day laden with food. The moment he arrived they clustered round him in eager excitement, alighting on his arms, shoulders, and head, and taking food from his hands and lips. Meanwhile a no less eager crowd gathered round his feet. Having rewarded one or two, he would, at a given signal, dismiss them, and others would at once take their place. And this system of rotation was constantly repeated till the store of food was done. In London parks, of which they began to take possession about the year 1883, a similar confidence in the human race is displayed: they will even alight on children's perambulators to pick up bread if enticed to do so. All this is the more curious, because wood-pigeons reared from the nest away from towns generally develop all the wildness of their race as soon as they attain the power of flight.

During the last hundred years the numbers of this bird have increased amazingly, owing in part to the destruction of predatory

birds—hawks, jays, and magpies—which preyed either upon the birds themselves or their eggs, and in part to the increase of land under cultivation, and of plantations affording them harbourage for their nests. As a consequence, the suspicions and ominous forecasts of the generation of farmers which first began to perceive this increase have been amply fulfilled in some parts of the kingdom at any rate; for, without doubt, this bird, in many parts of the country, is at times a veritable scourge, devouring immense quantities of corn, young turnips, and clover, according to the season of the year. Years ago, on the other hand, when these birds were kept within bounds, partly by their natural enemies and partly by more restricted harbourage, things were otherwise. Thus, for example, we find St. John in his delightful *Wild Life in the Highlands* striving to convince a farmer that "an immense flock of wood-pigeons, busily at work in a field of young clover," were really his benefactors. To prove his point he shot eight from the field which was being ravaged, and in the presence of the farmer straightway opened their crops. The results were exactly in accordance with his predictions. The birds had not been eating the clover, but "every pigeon's crop was as full as it could possibly be of the seeds of the worst weeds in the country, the wild mustard and the ragweed, which they had found remaining on the surface of the ground. . . ." And, he continues, "no amount of human labour and search could have collected on the same ground, at that time of the year, as much of these seeds as was consumed by these five or six hundred wood-pigeons daily for two or three weeks together. Indeed, during the whole of the summer and spring, and a considerable part of the winter, all pigeons must feed entirely on the seeds of different wild plants. . . ." To-day the tide has turned in the opposite direction, and not without some reason, this bird is viewed with extreme dislike by farmers in many parts of the country. Mr. T. H. Nelson, after the usual gibe at the "sentimental cabinet naturalists," tells us that the food of the wood-pigeon consists "chiefly of grain, peas, beans, beechmast, acorns, seedling potatoes, turnip-tops,

bulbs, and seeds . . picked up from the freshly sown drills . . . young clover, seeds of the wild mustard, charlock, dock and ragweed, gooseberries, and various other berries, seeds, and plants." The qualification "chiefly" appended to such a list, leaves one curious to know how the rest of the diet is made up! But it is clear that the wood-pigeon is not entirely harmful, as some would have us believe. Mr. Nelson himself remarks:[1] "In districts where it is not particularly numerous it probably does not harm the farmers' crops, but even benefits them, as, for instance, when unkindly weather in spring has arrested the growth of some of the white corn crops, allowing the hardy wild mustard to overtop the tender blade, the pigeon destroys the weed by stripping it of every leaf, and often the lowly chickweed furnishes it with an abundant repast." In the London parks, when this bird is abundant, I have frequently seen them, in the spring, feeding greedily on the young buds of plane trees, creeping as near to the end of the bough as possible, and craning their necks down to get at the end twigs just beyond them. The capacity of the crop, which has a peculiar bi-lobed shape, is astonishing. As many as sixty-one acorns have been taken from one such receptacle, from another seventy-three hazel-nuts. When a large flock is feeding, Mr. Abel Chapman tells us,[2] "among turnip fields, stubbles, or clover lea, they alternately feed and rest on the nearest trees, the birds in the latter position serving as sentries, whether purposely or by accident"; and, he continues, "a big pack of cushats on the feed can be made out a long way off by the habit of the rearmost birds continually flying up and alighting in the front rank, thus causing constant movement."

Reference has already been made to the enormous increase in numbers of the wood-pigeon, all over the kingdom, during the last century. A few figures may help to make this fact more readily apparent. Viscount Reidhaven, at the Central Banffshire Farmers Club, so far back as 1879, stated that on his father's estate, between

[1] *Op. cit.*, p. 91.

[2] *Bird Life of the Borders*, 2nd edit., p. 269.

the years 1876-79, 15,194 eggs, 1603 young birds, and 3733 old birds were destroyed, a total of 20,529. The amount of money expended as head-tax was £117, 13s. 3d. Similarly, the United East Lothian Agricultural Society, about forty years ago, over a period of about seven years, caused to be destroyed about 130,000 pigeons; but since 1870 the numbers of wood-pigeons in Scotland appears to have been materially decreased. Happily this bird affords most excellent eating, so that the slain can be utilised. Wherever their numbers increase sufficiently to demand drastic thinning operations, it is found more easy to attack them as they come home to roost than to endeavour to take them by surprise in the open. They always fly head to wind, and hence the guns must be placed accordingly. Mr. Abel Chapman, in his delightful *Bird Life of the Borders*, gives elaborate directions for such raids, and he further remarks that they vary their roosting-places according to the weather. In his own county a favourite spot was an old beech wood standing on high ground, and much exposed. But during rough or stormy weather they resorted to a low-lying wood of tall Scots firs. I have had many opportunities of studying these birds in Battersea Park, London, and note that, in the winter, when the trees are bare so as to reveal their movements, they congregate in considerable numbers, in certain parts, on the outskirts of the park, during the afternoon, then, as dusk falls, they betake themselves, gradually, to the trees on an island in the centre of a small lake.

In the matter of its plumage the wood-pigeon presents no very striking characters, but there is one peculiarity which I do not remember to have seen described anywhere. This refers to the arrangement of the feathers of the white neck patch and those immediately above, which have the appearance of being distributed in semicircular rows, divided by well-defined transverse spaces, thus recalling the longitudinal grooves down the necks of geese.

Of their habits during courtship, Mr. Edmund Selous writes: "The male . . . bows to the female lengthways along the branch on which he is sitting, elevating the tail at the same time, in just the

same way as does the stock-dove. As he does so he says "*coo-oo-oo*," the last syllable being long drawn out, and having a very intense expression with a rise in the tone of it, sometimes almost to the extent of becoming a soft shrillness. Having delivered himself of this long "*coo-oo-oo*," he says several times together in an undertone, and very quickly, "*coo, coo, coo coo*," or "*coo ooo, ooo, ooo, coo, coo, coo*," after which, rising, and then bowing, again he recommences with long-drawn, impassioned "*coo-oo-oo*," as before. Occasionally, when courting on the ground, according to Mr. Selous, the low bow is prefaced by one or more curious hops, a feature not remarked in any other of our native pigeons.

I also have had the good fortune to see something of this phase of the wood-pigeon's life-history, and have remarked that just before pairing they frequently feed one another, and immediately after each assumes a curiously "wooden" attitude, rearing the body upwards, and pressing the beak down upon the neck, which is thrust up as far as it can be strained, and these grotesque movements are accompanied by a strange raucous cry which refuses to be expressed in words. Of the earlier bowing and cooing, with inflated crop and outspread tail, which marks the beginning of courtship, there is no need to speak, for with this phase every one is familiar. This performance is varied by a very beautiful aerial display, the male launching himself into the air, rising and falling on outstretched pinions, in great curves high above the trees; occasionally the wings are brought smartly together over the back with a resounding snap. During such displays the white bar across the wing is most conspicuous. Both birds, I remark in my note-book, take part in the building of the nest; but the male alone appears to collect the sticks, which he brings to his mate. A very few are taken from the ground, nearly all are broken off from the tree. Suitable-looking twigs are seized by the beak and tugged at. If dead they readily break and are borne away, but should any drop they are not picked up. The growing nest which I kept under observation was placed on a big bough, close to the trunk of a

plane tree, and the sticks were passed to her in a curiously methodical, one might say mechanical manner, for though there was an ample fairway along the bough the bird always stood on the back of his mate and passed them over her head! This nest was completed in about three days. Both birds left the unfinished nest every night, and returned to their labours early in the morning.[1] On the fourth day the first egg appeared, and from then onwards she sat continuously, save for a short occasional break when she moved out along the bough of the tree for a few minutes, or went off to feed. The male during this time disappeared, save for an occasional visit. But during an unguarded moment, when the female seems to have gone off to feed, a carrion-crow came along and took the eggs. Both birds for about twenty-four hours hung about the empty nest disconsolately, and then betook themselves off, probably to try elsewhere! During the period of courtship, and the short spell of incubation before the disaster, the male kept up an almost continuous anthem of "cooing," "*coo-cōō-co-coo-co*; *coo-cōō-co, coo-co.*" This "song," for most of us, has a peculiarly soothing effect, and it is not, happily, confined to this season of the year, for it may be heard in almost every month when the weather is fine.

3. THE STOCK-DOVE AND THE ROCK-DOVE

[W. P. Pycraft]

The two species now to be considered present many points in common, and both differ, somewhat conspicuously, from the wood-pigeon, as will become plainly apparent presently. So similar in appearance, to the unpractised eye, are these two birds, that they are commonly confounded. This confusion is excusable, since, among the older ornithologists at any rate, Montagu, Bewick, and Fleming failed

[1] As has already been pointed out, p. 311, the wood-pigeon does not always take the trouble to build a nest, flimsy though this be; for it will adopt the deserted nests of sparrow-hawks and magpies as well as squirrels' dreys.

to discriminate between them. Yet, as we have already shown, the two birds are readily distinguishable. The very name stock-dove is a witness to this confusion, for by some, indeed, it was used under the impression that this bird was the ancestor of domesticated races of pigeons, of which more presently. By others it is supposed to refer to the bird's habit of nesting in the "stocks" of pollarded trees. But be this as it may, this species is an interesting one, if only on account of the adaptability it displays in the character of its breeding-places, and for the curiously indecisive nature of its coloration. Even the black markings on the wings suggest tentative experiments, for as yet they are neither bands nor spots, and, be it noted, they are wanting in the young, from which we may infer that there are incipient bands some day to be completed.

In its general habits it consorts alike with the wood-pigeon and the rock-dove, circumstances determining the association.

Of its courting habits Mr. Edmund Selous has made a few interesting observations. As seems to be the rule among pigeons, there is a great display of bowing, the breast meanwhile being inflated, and the tail spread fan-wise. Sometimes the male and female bow facing one another, sometimes one stands behind the other, so that one bird bows into space. But during this ceremony it would seem, with the stock-dove no sound is uttered. This curious performance takes place, as with the wood-pigeon, both on the ground and in the trees. Occasionally both male and female rise in the air and make much battle there, every now and then bringing the wings together with a smart snap, a sound which Mr. Selous supposes to be caused by one bird striking at the other with its wing in mid-air, but there is no sort of evidence that this is the case; on the contrary, it is highly improbable. The importunate male is, however, often repulsed by a blow of the wing when paying his attentions on the ground, just as the female sparrow will resist unwelcome or untimely attentions by seizing her would-be suitor by the feathers of the nape. The female stock-dove, however, having

driven away her suitor, will often bow as her crestfallen swain is retiring.

While the stock-dove is almost silent during his courtship, this is by no means true of the rock-dove, whose notes recall those of the wood-pigeon—"*coo, coo, roo, coo*"—and it is particularly vociferous during the early spring, when the male is intent on wooing. "At this season of the year," remarks Seebohm, "the male may often be seen performing various antics, and caressing his mate on the rocks, in a precisely similar manner to that of the domestic pigeon. He swells out his throat, droops his wings, and spreads out his tail like a fan, all the time serenading her with his soft winning notes; and should she take wing, he flies impetuously after her to repeat his courtship." But according to Mr. J. L. Bonhote, both the stock-dove and the rock-dove display something of the tyrant at this time, "driving the hen for a few days before she lays. On these occasions his whole time is spent in keeping her on the move, and he never lets her settle or rest for a minute, except on the nest."[1]

In their selection of a nursery these two birds present much in common, since both find congenial accommodation amid the crevices of sea-girt cliffs. But with the rock-dove such nesting-sites appear to be indispensable, for it never alights in trees. The stock-dove, on the other hand, nests also in limestone crags and quarries, hollow trees, the heads of pollard willows, on the beams of old church towers, squirrel dreys, and the deserted nests of other birds, *e.g.* magpie or crow, and in rabbit-burrows. In the open districts of Norfolk and Suffolk rabbit-warrens afford this bird excellent breeding grounds. Some occupy deserted rabbit-burrows, laying their eggs either upon the bare sand or a small quantity of fine roots, about a yard from the entrance. Some, on the other hand, seek the centre of dense furze bushes, using the entrance made by rabbits near the ground.[2] The young, which are ready for table early in June, are eagerly sought for by the warreners, to whom they are a considerable

[1] Bonhote, *Birds of Britain*, p. 272.

[2] Stevenson, *Birds of Norfolk*, vol. i. p. 356.

Rock-dove alighting on its nest
By Winifred Austen

source of profit. In consequence, almost every warrener keeps a "dawe-dawg"—that is to say, a dog trained to discover the burrows which contain the quarry.

The nest of the rock-dove, which is a scanty structure, is made of dry grass or seaweed, a dead stick or two, and sometimes a bit of heather; and this is laid on some convenient ledge in a rock crevice, or, for choice, in the roof of some great cave, and it would be hard to find a more awe-inspiring chamber for a nursery. The roof, wherever the daylight reaches it, stands revealed in all the colours of the rainbow, strangely intermingled, the floor a shelving beach at low-water, at high, and in rough weather a swirl of angry heaving waters which, flinging themselves at the walls, fall in torrents with a booming as of thunder. Every ledge lodges a nest of cormorants or gulls, while puffins and pigeons share the crannies between them. Though both birds take part in the work of incubation, the female performs the greater share of the task, but she is all the while assiduously fed and tended by her mate. Two or three broods are reared in the year, and it is significant that the eggs are slightly smaller than those of the stock-dove, and that the young do not leave the nest till well able to fly.

Though, after the manner of its tribe, the clutch is limited to two eggs, yet the stock-dove is a fairly prolific bird, rearing two broods in a season. Still it must have many enemies, for it is a comparatively solitary species, and nowhere very abundant—measured by the standard of the wood-pigeon. Nevertheless the stock-dove, remarks Howard Saunders,[1] is a south-eastern species, which has been slowly increasing its range throughout these islands during recent years. It was unknown in Northumberland, remarks Mr. Abel Chapman, till the early eighties. Out of some thousands of wood-pigeons killed at Silksworth during twenty winters, not a single stock-dove was taken till 1879, "then we got one which was considered a rarity." The following winter three or four were taken, while during the winter of

[1] Ussher and Warren, *Birds of Ireland*, p. 223.

1884-85 they were quite common. They sometimes flew to roost with the wood-pigeons, and birds of both species were killed out of the same flock, but more often the stock-doves came separately in small parties of six or eight. Similarly it has extended its range into the south-western counties of England and into Wales. In Ireland it was unknown till 1875, but is now resident in parts of Leinster and Ulster,[1] and is gradually increasing its range. In Ireland, as elsewhere, it commonly associates with ring-doves, but always seems to separate from its congeners on taking flight, when, by their smaller size and more rapid wing-beat, they are readily distinguished.

This gradual extension of range is interesting, and would seem to be due in no small degree to the bird's ability to adapt itself to circumstances, especially, as we have already pointed out, in the matter of breeding-sites. Yet this interpretation is hardly adequate, since the wood-pigeon, showing less resource, is by far the commoner species. It is significant, indeed, that in no part of its range without the British Islands is it met with in so great abundance as its larger congener the wood-pigeon.

By the destruction of its enemies, as we have already shown, the wood-pigeons' population has become abnormally high, and hence, from the stress of obtaining sufficient food, a bird at one time regarded with favour by the farmer is now banned as an outlaw. One cannot help speculating as to the future of the stock-dove, which is, as we have shown, also increasing, and may, in consequence, be similarly driven to take an undue toll of the fruits of man's labour, for in the matter of its choice of food it closely resembles the wood-pigeon. But it is significant to note that in the case of a bird of each species, shot at one discharge, the crop of the wood-pigeon contained a great mass of clover, turnip-tops and bulbs, the crop of the stock-dove contained an egg-cupful of charlock seeds, some barley, and several weed seeds, but no clover.[2] The only charge so far levied against the stock-dove

[1] Ussher and Warren, *Birds of Ireland*, p. 223.
[2] Yarrell, *British Birds*, vol. vii. p. 8.

is that of damage to bean and pea fields, and to mustard-fields when the seed is ripe, and this liking for mustard it shares in common with the turtle-dove, while the wood-pigeon appears rarely, if ever, to eat these seeds; but the harm wrought is not great, and seems to be more than atoned for by the great quantities of charlock seeds consumed by these birds and of which they are especially fond. The rock-dove, being nowhere so abundant as the stock-dove, a fact sufficiently explained by its conservative habits, its numbers are not sufficiently great to enable it to commit "ravages" on the farmers' crops, even though it be compelled to fly inland for the greater part of its food. Like its congeners, it is partial to grain, but it atones for this weakness by eating the roots of the couch-grass (*Agropryon repens*) and the seeds of numerous troublesome weeds, as well as large quantities of snails. The bird's-foot trefoil is among the seeds which it specially favours.

Like its congeners the rock-dove drinks frequently, and in Egypt, in places where the banks of the Nile are so steep that the birds cannot alight on the shore to drink, both Mr. R. S. Skirving and Mr. E. C. Taylor have observed whole flocks settle on the water like gulls and drink while they floated down-stream: and the same habit has been observed in tame pigeons at Cologne when the shore-ice in the Rhine prevented approach to the water. Unlike most birds the head is not raised during the act of drinking.

Of its habits we have yet much to learn, for it has been, and still is, commonly confused with the stock-dove, and consequently records from places frequented by both species are to be regarded as requiring revision. At all times gregarious, it is not a migratory bird, though in hard weather it will wander from its usual haunts, sometimes in great flocks.

That this is the bird from which all our varieties of domesticated pigeons have been derived is certain, and if only for this reason the rock-dove is a species of quite peculiar interest. As we have already remarked, it never alights in trees, a peculiarity shared by its domesticated descendants, and is rarely found away from surf-beaten cliffs.

But even here it is now difficult to secure pure-bred birds, owing to interbreeding with dove-cot pigeons decoyed away from home. Last year I endeavoured to secure pure-bred birds from caves in Donegal, but out of about twenty birds shot all but two showed more or less evident traces of interbreeding with house-pigeons : some could not be distinguished from "blue-rocks." Darwin, it may be remembered, long ago drew attention to a very curious fact in regard to the coloration of the rock-dove, and the domesticated variety thereof, which so far has received no explanation. "There seems," he says, "to be some relation between the croup being blue or white, and the temperature of the country inhabited by both wild and dove-cot pigeons; for nearly all the dove-cot pigeons in the northern parts of Europe have a white croup like that of the wild European rock-pigeon; and nearly all the dove-cot pigeons of India have a blue croup like that of the wild *C. intermedia* of India."

Are we to infer from this that the presence or absence of pigmentation is determined by climate? or that the white area is a colour variation, or colour "mutation," whose presence or absence is determined by Mendelian factors? That is to say, the coloration of the rump is determined not by climate, but by germinal variation, and the interbreeding of birds presenting two forms of this variation. There are inexplicable and contradictory features in either interpretation, and it were profitless to pursue the theme further. Let it suffice to draw attention to the problem, which stands where it was when Darwin propounded it.

4. THE TURTLE-DOVE

[W. P. Pycraft]

The turtle-dove differs conspicuously from our other native pigeons in coloration, the dominant hue of the upper parts being ochreous yellow, while the beautiful metallic iridescence of the neck is entirely wanting. Furthermore, unlike its congeners in these

Stock-dove drinking
By G. E. Collins

islands, it disappears entirely during the winter months, which are spent in more southern latitudes. In its habits it more nearly recalls the wood-pigeon, since it shows a preference for park-lands, woods, and plantations, and hence, like the wood-pigeon, its numbers during recent years have considerably increased, though, as will have been already remarked, it is still a rare bird both in the northern portions of Great Britain and in Ireland. Somewhat less gregarious than its congeners, it gathers, however, in flocks in autumn, young and old resorting to the stubbles and root-crops, devouring such grain as may be picked up, and besides, a considerable quantity of the seeds of weeds. It drinks frequently, and seems to show a decided liking for salt water, and hence Stevenson suggests that this is the reason why this bird is so abundant near the coast. Other pigeons are known to prefer brackish water to fresh. The flight is swift and powerful; often, as is the custom among the pigeons, the wings are brought smartly together over the back, producing a sharp, snapping sound.

Mr. Edmund Selous has described the courting-habits of the turtle-dove in some detail. The display made at this time resembles that of other pigeons, but the bowing of the male differs from that of, say, the wood-pigeon in that it takes the form of a series of "quick little bows, or rather bobs," . . . "instead of one or more slower and much more imposing ones." All the while this "bobbing" is going on he "utters a deep rolling, musical note, which is continuous (or sounds so), and does not cease till he has got back into his more everyday attitude. When this ceremony is performed on the ground, it would seem that between the bows he makes a "curious dancing step towards the female." But besides this, "these birds," continues Mr. Selous, "have another and charming nuptial disportment." Herein one of a pair sitting in some high tree will every now and then fly out and upwards, make one or two circling sweeps around and above it, and then after remaining poised for some seconds, descends on extended wings in the most graceful fashion, alighting on the same branch beside his waiting partner.

The duties of nest-building, incubation, and the care of the young are, as in the other species herein described, shared by both sexes. But the nest, as a rule, is a very flimsy structure, though Seebohm says that occasionally it is much more compactly built. As in the case of the wood-pigeon, it is never placed in holes or burrows in the ground; but while the wood-pigeon always places its nursery high up, this is by no means true of the turtle-dove, which is often content with low shrubs, or a high, thick hedge, as a lodgment for its cradle. Occasionally, however, it will select the boughs of a tree forty feet from the ground.

Turtle-doves
By A. W. Seaby

XI

PLOVER AND CURLEW SHOOTING

By Major Hugh B. C. Pollard

Curlew and plover belong to the domain of the shore-shooter, that hardy spirit who is content to be out on the cheerless marches in the bleakest weather.

Occasionally one meets young curlew fresh bred on inland moors, and plover, too, come the way of the game shooter as occasional visitants driven inland by frost or hard weather. The common lapwing is, however, a privileged bird when inland, for he is so much the farmer's friend that gun is seldom raised against him. Indeed in some counties he is scheduled as a protected bird—one that may not be shot. This is possibly wise, but any honest bird lover will admit that a short Act prohibiting the sale of plovers' eggs would be really useful, while the damage done to the bird stock by shooting is almost negligible.

Shore shooting has a number of devotees ranging from the semi-professional longshoreman or marshman, who shoots for the market or the pot, to the visiting sportsman or local landowner, who is almost more naturalist than shot. It is of necessity a solitary form of enjoyment, but once its joys have been experienced it exercises a peculiar fascination.

The charm lies, I think, in the particular difficulties one encounters, or it may be in its way a reaction from the rather stereotyped programme of the conventional land shoot There you may almost depend on it that your fields and covers hold birds, and that, barring accident, you may be sure of a moderate bag. Down on the mud flats and saltings you are never sure of a shot, and there is infinitely more real hunter's craft needed if you are to bring back even a brace of birds.

Shore shooting is not just aimlessly wandering along a beach or

along the banks of creeks and estuaries with a gun. It is a sport that above all calls for certain qualities of observation, and involves a great deal of knowledge of the ways of birds in relation to tides, wind, and weather. This can only be gained by experience and knowledge of a definite section of ground.

The devices and stratagems successful in one area will for no easily explainable reason utterly fail at another place. This we then explain by saying that the birds know too much. In point of fact we know too little.

The groundwork of some useful knowledge of shore shooting may be gained in August, when, if circumstances or economics prevent a journey to the moors, you are probably at the seaside. There is no need for a gun, for though the season is legally open the shore birds are not mature and flapper ducks should be spared. A good field-glass is really useful, and if you have a taste for wild-bird photography, well, so much the better.

Your object in this peace-time practice is to learn to get as close to birds as you can, and, above all, to learn something of their ways of flight in wind, and their calls. All this knowledge is required later, when, instead of blazing August sun and mild breezes, you turn out in the teeth of the cutting East Coast wind to face a leaden sky and a waste of bitter waters.

The two main points to master are how to keep hidden, or rather unperceived, until birds are within shot, and how to judge when they are within range. In nine cases out of ten novices are entirely baffled by the difficulty of judging the range of unfamiliar birds flying in ways unlike those of the game birds they are accustomed to and against unfamiliar backgrounds. Water, beaches, mud flats, and sky all lead to extraordinary underestimation of distances. If we take the practical killing range of the ordinary 12-bore game gun as being not the theoretical 40 to 60 yards of the gun crank and paper expert, but the normal 35 yards of common shooting experience, it is astonishing how close a bird must appear to be before it is practically within shot.

These are preliminaries—but important ones. How necessary they

are you can easily ascertain by locating through field-glasses any of the little waders, ringed-plover, whimbrels, or oyster-catchers, then working round under cover and estimating how close you have got to them before you put them up. Then pace the distance, and you will probably find that what you calculated was 30 yards was something nearer 50 yards.

Experience of the difficulty or hopelessness of working up to shore birds in the open brings one to the second consideration of getting into a suitable hide, and waiting for the birds to come to you. As the tide flows, the feeding grounds, mudbanks, shell flats, and oozes are slowly covered, and the birds make for the shore or remain clustered on diminishing islands until the water obliges them to fly landward.

These flights are apparently dominated by a law of probability, and provided that the weather is not very variable a line of flight can be plotted out which is the favourite route from the tideway to the marshes beyond the clay beach and seawall. The gunner, either in a regular "hide" or shelter, or in a natural position affording cover, must strive to pick a position on this line of flight.

As birds approach the land line they rise, and experience suggests that not only must the gunner's position be such as to avoid any betrayal, as being against the sky-line from the point of view of birds coming in from the water, but that it is equally important that the rising birds should not be able to look down into the hide or pit until they are within shot.

Elaborate hides are a nuisance, and difficult to maintain on wastes and foreshores that are not private ground. Any old hole and a drift-wood box or an old basket can be made into the essentials of a hide. The simplest and lightest cover is perhaps a yard or so of old netting 3 or 4 feet high, sprigged with grass and marsh plants and supported on slender canes. It is no weight to carry, and can be rolled up in a moment. This screen, transparent enough to the gunner, can be arranged to provide excellent "head cover," and provided he makes no abrupt movements on the approach of birds, they will not see him till they can see actually into the pit. Then they will check or "toss," which is the moment for the shot.

Cliff or rock conditions call for kindred precautions adapted to the character of the terrain. Sometimes birds will fly heading the wind before a storm along the strip of coast-line, and one may build a cairn and enjoy ideal conditions as, irrespective of tide or weather, a long intermittent flight of all sorts of birds sweep by at varying intervals. Often they will be too far out to sea, but sometimes—possibly because the air currents are more favourable to flight below the wind-break of the cliffs—they will follow the beach. Black duck, cormorants, curlew, flocks of green plover, greenshanks and waders, and small birds of all kinds will take it into their heads to change ground. To be out on such an occasion is to enjoy a red-letter day.

To offset this there are too many occasions when the turn of the tide is so late and dusk so early that a long trudge over clay as slippery and adhesive as that of the Ypres salient only results in disappointment. You get gradually colder, the birds which you can hear calling fly languidly landward just out of shot, or a boy and a dog or a cockle-gatherer put the birds up just when your chances were ripening. Then, too, there are those moments of anguish when, after you have fired both barrels and are reloading, and, as luck will have it, hit or missed, the alarm brings over you the lightning whir of a flock of birds you have not time to meet.

The sportsman unaccustomed to shore conditions does not realise how quickly approaching birds can divert their flight once they see you or your dog. Movement is even more fatal in this kind of shooting than in deerstalking. The moment a bird's suspicions are aroused it changes ground or diverts its line of flight. For this reason the actual taking of a shot is a matter of vital importance. There is no time for a covert-side style of mounting the gun to the shoulder as the birds approach. All movement must be arrested or carried out under complete cover until they are within shot—*then* swing up, fire, and as they "toss" let them have the second barrel in the confused instant that follows. Too brusque a movement spoils one's shooting, particularly as for this kind of work you are probably very thickly clad and quick movement is limited. The ideal is perhaps not realised until you have reached a stage of

experience at which you automatically judge when an approaching flight will be within shot, and from complete cover and without keeping the birds continuously in view, rise from behind your breastwork to confront them as they enter your range zone.

Experience of weather conditions and observation of fowl on a given ground will soon lead to your developing ideas on the probable movements of the birds. Duck and curlew are fairly conservative, and their movements may be predicted in so far as one can be certain about anything connected with such an uncertain subject as shore birds' movements. Plover, both green and golden, are far more difficult, and they change ground from one set of marshes to another or forsake their favourite mud flats and go flighting in large flocks for no ascertainable reason at all.

Sometimes you may find every mudbank alive with fowl, so that the water encroaching with the rising tide seems fringed with an endless flicker of feeding birds, and small skeins of fowl fly low over the water from islet to islet. A sharp frost seems to wake up the whole bird population of the shore, and plover often change ground, flying to more favourable quarters with the first sharp frosts. A good moon and a sharp frost suit the professional fowler, for he knows that the birds find little sustenance on the frozen creeks and clay banks of the marshes, and are driven to make the most of the feeding grounds between tide levels. A prolonged frost and real hard weather he does not care for, because the birds, though plentiful, may be so stressed as to be in such poor condition that it is hard to find a market for them.

The professional fowler, whether punt gunner or shore shooter, is a tutor from whom much may be learned, though it is not always easy to remember that he sees his shooting and all connected with it almost entirely from the point of view of "the market." He uses odd and unrefined weapons, and in most cases loads his own cartridges with empirically evolved loads that would horrify an ammunition maker. He is not wasteful of ammunition, and seldom hazards a shot unless fairly certain of success.

Where he beats the good amateur is not in marksmanship or bird

craft but in the peculiar art of "calling." He will make his way to his hide, and as dusk falls and the tide flows to its full he will imitate the particular notes of the birds which they use when coming in and settling on their resting grounds. These notes are quite distinct in tone from the familiar—too familiar—alarm cries, such as the *curr-leee currl-ee* of the curlew, or the shriek of that public nuisance the greenshank, whose sputtering hysterics alarm a whole marsh in a second.

I believe that continental sporting goods dealers do a good trade in manufactured bird calls, supposed to reproduce the calling notes of various birds. Possibly these may be effective in the mating season—a time little respected by the continental gunner in general—but I do not know of any successful mechanical bird call in use in this country. The professional achieves it by putting two fingers in his mouth in the manner that butcher boys accomplish their ear-piercing whistle, and producing softly modulated "churring" calls and short falling cadenced whistles.

The magic of it is that sometimes—not by any means always—it works. A curlew passing out of range will hear the call and bear over to fall a victim to the deception. General opinion holds that in the majority of cases it is the young curlews who fall the easiest prey to this device. This, though sad, in that it seems a shame to abuse their inexperience, is as the shore gunner prefers to have it, for the young curlew is by far better eating than his parents. Bred on inland moors, he has not yet had time for the strong flavour of shellfish and marine worms to taint his tender flesh. Properly cooked, a young curlew is not far inferior to the best wild duck.

Decoys are little used in shore shooting, for even ducks, who come readily to decoys on inland waters, steer clear of these lures at sea. A string of cork ducks is sometimes used, but their efficiency is doubtful. Cork plover sand small wader decoys are also used occasionally ; but as in most places the reach of flats covered by the tide is very large, there is little use in dotting a handful of decoys about just beyond the hide. I am inclined to think that their immobility rouses suspicion, for the waders are a restless crew ; and even the curlew, though he may stay

a long while in one small area, is usually moving about and prodding for worms and food.

The plover can usually be depended on to flight at dusk irrespective of wind or tide. They usually have a selected flight-line, and wheel in and out over the fields or marshes for perhaps a mile behind the coast-line. If they come in with the wind they are usually flying too high to be within shot, but if the wind is blowing off the land they customarily fly low. As the wind often falls at dusk, plover flighting is seldom as reliable as the flighting of ducks, for when the wind is light the height of flight seems to be variable. They learn quickly if an area is dangerous, and when disturbed by gunners, soon learn to keep out of reach.

Shore shooting involves rather different equipment from the normal game-shooting gear. In the first place it is not wise to take a hundred-guinea ejector for this work. A stronger and cruder weapon that will not suffer much from the adhesive clay and the salt water is far more useful. The days of the large bore "double eight," or even the giant 4-bore, are now almost over, and the favourite weapon is a long-chambered 12-bore that will take the 3-inch case.

This gun is of necessity heavier than the ordinary game gun, but it is quicker to use and infinitely easier to carry than any of the old large-bore pieces, whose utility is limited mainly to goose shooting. Such a gun is not expensive, and an ordinary B.S.A. machine-made gun taking the 3-inch wildfowl case is both cheap and efficient. The stock should be altered by your own gunmaker, but should be a full half-inch shorter than your normal length in order to allow for the very necessary extra clothing.

Shore shooting involves rather a wide range of shot sizes, for there is a real need to select cartridges with loads appropriate to the quarry. No. 2 is a good weighty pellet, as suitable for geese or cormorants as heavier sizes. No. 4 is perhaps the best general standby for curlew, duck, and equivalent birds. It is also very reliable for high-flying plover, but the greater number of hitting chances given by small shot must also be taken into account. For

shooting at plover and shanks from a hide or walking up along a narrow creek No. 7's are the best investment. Despite their small size they will kill duck or curlew within 25 yards. In practice it can be boiled down to two sizes of shot in different coloured cases kept in different pockets—7's for the right barrel, 4's for the left. A few heavy-shot cartridges as a reserve for special occasions for long-range shots at heavy fowl may also be carried.

Clothing needs to be ultra-warm wool. A thick sweater or a jersey over all is excellent if unsightly, and though oilskins are essential for really squally weather, an old raincoat of mud colour will do for normal occasions. It is almost impossible to avoid getting plastered with mud and clay when negotiating estuaries and saltings. For this reason rubber thigh boots, which can be washed down with a mop afterwards, are as practical as anything, although they are condemned by purists who affect leather sea-boots. A cap with ear flaps or a "Balaclava helmet" makes a comforting headgear.

The dog needs to be well trained or he is worse than useless. Above all, he must learn to sit dead quiet in the hide and not attempt to clamber out of the pit the moment your first barrel is fired. An energetic but tactless retriever may deflect the best chance of the day.

So far as equipment is concerned, a light entrenching tool is a distinct asset. It can be bought for a song from dealers in ex-army goods, as can excellent waterproofs and a variety of trench clothing, etc., entirely suited to the shore-shooter's purpose. The clay of the eroded shores is easy to dig, and with an entrenching tool a natural depression can be improved, or, if need be, a regular emplacement built up in half an hour's labour.

There is one more mode of curlew shooting that is occasionally practised, usually from small yachts waiting for the tide on mud flats. This is rifle shooting with a ·22 long rifle. The bird affords a fair target, though usually against a difficult background. Range is not easy to estimate, but the noise of a ·22 is so little that it does not alarm the whole marsh as does the report of a shotgun. A miss is therefore not a matter of consequence.

The solid-bulleted ·22 long cannot be relied on to bring down a bird unless hit in a vital spot. The ·22 long with the hollow-pointed bullet is infinitely more effective, and a bird hit anywhere in the body with this is bowled over at once.

This rifle shooting over water and mud flats is extremely difficult work, for distance judging is peculiarly baffling. There is, however, one rifle which simplifies matters—the ·22 high-power Savage. This fires a ·22 bullet backed by a cartridge not very much smaller than the ·303 service, and the bullet has such a flat trajectory that once the rifle is sighted, say, for 50 yards, no adjustment of sights is necessary, and it shoots without material drop up to 300 yards.

In practice, wind can be discounted up to about 250 yards; but after that range is reached the velocity is lost by the bullet so swiftly that even moderate breezes lead to strange vagaries.

The utility of the high-power is that strange birds—cormorants, divers, etc.—well beyond shotgun range, can be shot with it; and it has another advantage: it is not as dangerous as a rook rifle for use in populated districts, for the bullet smashes to pieces the moment it hits anything, even soft soil. It is powerful enough for use on deer, and is an ideal tool for clearing the predatory cormorant or heron off a bit of carefully stocked trout water.

XII

NATURAL HISTORY OF THE PLOVERS AND CURLEWS

PRELIMINARY CLASSIFIED NOTES

[W. FARREN. F. C. R. JOURDAIN. W. P. PYCRAFT. A. L. THOMSON]

DOTTEREL [*Eudrómias morinéllus* (Linnæus). Land-dotterel (Kent); dotterel-plover (S. Scotland). French, *pluvier guignard*; German, *Mornell-Regenpfeifer*; Italian, *piviere tortolino*].

1. **Description.**—The dotterel, when adult, is easily distinguished by the broad white prepectoral band, and the large patches of chestnut and black on the breast. The sexes are alike, and there is a marked seasonal change of plumage. (Pl. XXXVII.) Length 9 in. [228·60 mm.]. The crown is black indistinctly streaked with brown; above each eye is a broad band of white which extends backwards on to the nape, meeting its fellow of the opposite side; the hind-neck and mantle are of a brownish ash-grey, relieved on the interscapulars by more or less conspicuous marginal loops: the hinder scapulars, wing-coverts, and long inner secondaries have similar rust-coloured margins. The inner primaries are of a light slate-grey, the outer dark slate fading into black towards the tip, and the outermost primary has a conspicuous white shaft. The tail is brownish ash broadly tipped with white, except the central pair, which have pale, narrow, buff margins. The sides of the face and throat are white. On the fore-neck the feathers are greyish ash margined with buff, the prepectoral region is marked by a broad double band of white, bounded in front by a narrow band of black; occasionally there is a black band on either side of the white crescent. The fore-breast and flanks are chestnut; the mid-breast is of a rich brownish black, while the abdomen and under tail-coverts are white. After the autumn moult the black and white crescent, and the black and red patches on the breast, are wanting, the under parts being white. The juvenile plumage

differs from that of the adult in having the eye-stripe buff, the crown more distinctly striated; the interscapulars and scapulars are black with a buff spot on each side of the vane, giving this region the appearance of being coarsely flecked with buff, and thereby differing conspicuously from the delicate scale-like pattern, or absolute uniform coloration of the adult. The long humerals and inner secondaries are coloured as in the adults, but buff replaces white on the tail. The under parts are buff narrowly and sharply striated with dark slate-grey. There is no prepectoral band, and the breast and flanks are of a rich buff, but the abdomen is white. The young in down has the forehead white, with a median and two lateral bands of black, the latter converging to meet in the middle line to form a median band which, on the crown, gives place to a circle of black enclosing an area mottled buff and black, the black ring being itself surrounded by a broad ring of white, cut off from a white collar by a narrow black line. Behind the eye is a patch of buff encircled by black. The rest of the upper parts are mottled black, buff, and white, while the under parts are white. [W. P. P.]

2. Distribution.—In the British Isles, outside Scotland, the dotterel is only a summer resident in very small numbers in the Lake district, though formerly it was much more numerous, breeding on many of the higher summits. In Scotland it is more widely distributed, and has increased its range. A few pairs are stated to have bred in S.W. Scotland, on the hills of Galloway and Dumfries; but the stronghold of this species is the great mountain system which includes the Grampians, the Monadhliath, and the Cairngorm groups, from North Argyll and Perth northward, and probably in smaller numbers west of the Great Glen. Here it breeds locally at a height of about 2500 to 3000 feet. On the Continent it breeds on the Scandinavian high fjeld in both Norway and Sweden, as well as in Finnish Lapland. In Russia it has been found nesting on Waigatz and Novaya Zemlya, and on the tundra of the north, as well as on the island of Kotlin (St. Petersburg), in the Northern Urals, and even in the steppes of the Astrakhan government. Other continental breeding-places are the Riesengebirge in Bohemia, Transylvania, and Styria. In Asia its range extends across the tundra region of Siberia, to the new Siberian Isles, and above the tree limit in the mountain ranges of the Alatau, Tarbagatai, Altai, and Sayans mountains, as well as in the ranges of E. Siberia. Its winter range extends to S. Europe, Northern Africa, Palestine, Persia, and Arabia. [F. C. R. J.]

3. Migration.—A summer visitor and a bird of passage. The birds first arrive late in April or early in May, and for a few weeks they remain comparatively widespread. But only a small number remain for the summer, and they are con-

fined to the regions mentioned in the preceding paragraph. The return migration is over by early September. A gregarious migrant. [A. L. T.]

4. Nest and Eggs.—The nest is little more than a depression in the moss, sometimes lined with the red leaves of the cranberry or a few bents. The eggs are typically 3 in number, though occasionally 2 have been found highly incubated, and a nest with 4 eggs has been recorded (*Ibis*, 1904, p. 229). They bear a decided likeness to some eggs of the Arctic-tern, and are clay-yellow or yellowish olive in ground-colour, boldly spotted and blotched with black markings, and occasionally showing a few ashy grey shellmarks. They are more ovoid than pyriform in shape, and the average size of 16 eggs is 1·62 × 1·14 in. [41·2 × 28·8 mm.]. Incubation is partially (if not entirely) performed by the male bird, as Pearson, H. H. Slater, and others have shot males from the nest (*Ibis*, 1896, p. 211; *British Birds, their Nests and Eggs*, v. p. 6). There is very little direct evidence as to its duration, but Heysham, who had good opportunities of watching it on the hills of Lakeland, says that it rarely lasts much longer than 18 to 20 days. The usual breeding time in the British Isles is from about June 5 to about the end of the third week in the month. Clutches taken in July are probably second layings, but there is no evidence that a second brood is reared in the season. [F. C. R. J.]

5. Food.—Mainly insects of various kinds, especially beetles, and their larvæ. Also land-shells and a little vegetable matter. The young feed chiefly on insects and their larvæ, and are assisted in their search for food probably by both parents, but there is no direct evidence. [W. F.]

RINGED-PLOVER

[*Ægialítis hiatícula* (Linnæus). Sand-lark, stone-hatch, stone-runner, dotterel, oxbird, tullet; catpoll, dunwilly (Devon); sand-tripper, five-toed plover (Dumfries); sandy-loo, sandy-laverock (Shetlands). French, *pluvier à collier*; German, *Sand-Regenpfeifer*; Italian, *corriere grosso*].

1. Description.—The ringed-plover is readily distinguished from its congeners by its yellow legs and toes, and the fact that the middle region of the shafts of the exposed portion of the primaries is white. The sexes are alike, and there is no distinct seasonal change of coloration. (Pl. XXXVIII.) Length 7·75 in. [196·85 mm.]. The adult has a broad band of black and white across the forehead; and a black bar, extending from the lores backwards below the eye, while the crown and nape are of a pale grey-brown. Behind the eye is a white patch, and the under surface of

the head is white, the white area extending upwards and backwards to encircle the neck: below the white throat is a broad band of black, which similarly extends upwards and backwards to encircle the neck behind the white collar just described. The mantle and wing-coverts are, like the crown, of a pale grey-brown, but the major coverts are tipped with white. The lower back and upper tail-coverts are coloured like the mantle; the median tail feathers are of a similar hue at the base, but darken into a deep brownish black towards the tip; the three succeeding feathers are similarly coloured but have white tips, the next pair have the outer web wholly white, while the outermost are entirely white. In addition to the white on the shafts of the primaries already referred to, the innermost primaries have an oblong patch of white along the middle of the outer web, forming a white bar in the extended web. The secondaries have white bases, the white gradually extending downwards from without inwards, so that the innermost feathers are wholly white. The breast, flanks, abdomen, and under tail-coverts are white. The beak is orange-yellow at the base, the rest black, and the legs are orange-yellow. The iris is dark brown. The female has the black collar somewhat smaller. The juvenile plumage differs from that of the adult in lacking the black band across the forehead; while the band below the eye and the collar round the neck are of a dusky brown instead of black. The young in down have the upper parts white relieved by a narrow line of buffish grey on the crown, and a semicircular line running round the occiput; on either side of the median line are fine mottlings of grey. The back is mottled grey, and the under parts are pure white. [W. P. P.]

2. Distribution.—In the British Isles this species is resident, or only subject to local movements, on almost every part of our coasts where there is any sand or shingle. It also breeds at considerable distances inland at a few places: the waste lands near Thetford have long been known to be inhabited by this species, and recently it has been found nesting on a sewage farm near Enfield, Middlesex, by R. B. Lodge, and also in Worcestershire, as well as locally in Scotland. Outside the British Isles it nests in Iceland, the Færoes, sparingly on Spitsbergen and Bear Island, on Novaya Zemlya, Waigatz, and Kolguev. On the Continent it is found along the coasts of the Atlantic and Arctic Oceans, as well as in the Baltic, and in some localities breeds inland, as in the fells of Lapland, by the great rivers of Russia south to about lat. 48½°-50°, in Hungary, and on the shingle-beds in the Rhone valley. Its southward limits extend to Portugal, occasionally to S. Spain, and a few pairs are said to remain to breed in Italy and Sicily. In Asia it ranges east at least to the Kolyma valley

Photo by A. M. Stewart

Dotterel's nest

Photo by C. W. Colthrup

Ringed-plover's nest on mud flat, composed of dry mud flakes

Photo by W. Farren

Ringed-plover's nest with egg and chick, also chick out of nest

and Ussuria, and south to about 60° on the Lena, while, according to Severtzow, it rarely breeds in Turkestan. In the Nearctic region it breeds in Greenland and Davis Strait, but is replaced by an allied race in North America. The winter quarters of this species lie in the Mediterranean region and Africa, where it has been recorded as far south as Cape Colony and Natal, chiefly along the east and west coasts. It also occurs in the Azores, Canaries, Madeira, India, Australia, Chile and Barbados accidentally, while the American race winters in S. America. [F. C. R. J.]

3. Migration.—Found in the British Isles all the year round in varying numbers, and probably resident to a large degree in England and Wales and in Ireland: from Scotland a considerable exodus takes place on the approach of winter. In winter a considerable number of ringed-plovers come to us from Northern Europe, many of the birds passing the winter in Ireland and the south of England: there is also some evidence of an immigration to the south-east of England by an east-to-west route (cf. Clarke, *Ibis*, 1904, p. 141). A slight southward emigration takes place in autumn, whether of British-breeding or autumn immigrant birds it is difficult to say. Birds of the smaller race visit the south-east of England in spring, and a few may possibly remain to breed (cf. Ticehurst, *B. of Kent*, 1909, p. 417). A gregarious traveller. [A. L. T.]

4. Nest and Eggs.—There is considerable variation in the nesting-habits of this species. Some nests are mere depressions in the gravel or shingle, others are carefully lined with fragments of water-worn shells and white stones, while some birds built a regular nest, more or less composed of bits of bent, small sticks, bits of stalk, driftwood, sea-wrack, and in one case green leaves and stalks of *Atriplex littoralis* (H. W. Feilden).[1] The sites also vary considerably from shingle-beds and sand-flats to stony hillsides (Færoes), thick grass (Middlesex) and cornfields (O. Grabham, *Field*, June 7, 1902). (Pl. xxxv.) The eggs are normally 4 in number, sometimes 3 only may be found incubated, and on rare occasions 5 have been recorded. They are pyriform in shape, the ground-colour being clay-yellow or ochreous, and spotted with brownish black. A rare variety has handsome blackish blotches, while others have been recorded with blue ground and devoid of markings, or white and only faintly marked. Seen from within, the shell is deep blue-green when fresh. Average size of 64 eggs, 1·34 × 0·95 in. [34·2 × 24·7 mm.]. Both sexes have been seen incubating (W. Farren and F. Heatherley). Faber and Graba (the latter on the evidence of a brooding spot) state that the male takes part in

[1] See *British Birds*, i. p. 373.

incubation. With regard to the period, there is some discrepancy in results. In an incubator one egg hatched on the 22nd, another on the 23rd, while a third lingered till the 25th (W. Evans), while eggs watched were hatching on the 21st day (W. Evans); on the 25th day from the laying of the last egg (R. Clyne), or 28 days from the laying of the first egg (A. H. Patterson). The eggs are laid at intervals of a day. The breeding season in the south of England begins about the beginning of May, but exceptionally eggs have been found by mid-April, or even earlier in the Breck district (W. Farren). As they may be met with through June and even in July, it is probable that two broods are often reared in a season in the British Isles. [F. C. R. J.]

5. **Food.**—Various small marine animals, such as the smaller thin-skinned crustaceans, small molluscs, and worms. Insects in various stages. Results of stomach analyses are as follows:—Adults and young in down, principally insects, their larvæ and pupæ. Adults, also remnants of plants (Manniche, *N.E. Greenland*, p. 126). Vegetable matter has also been found in stomachs examined by Prof. Patten, and "one gizzard was filled with remains of lustrous blue-black beetles" (*Aquatic Birds*, p. 217). The food of the young consists chiefly of insects and their larvæ and pupæ, also sandhoppers and small worms. They are assisted in the search for food by both parents. [W. F.]

KENTISH-PLOVER [*Ægialítis alexandrína* (Linnæus); *Ægialitis cantiána* (Latham). Stone-runner. French, *pluvier à collier interrompu*; German, *See-Regenpfeifer*; Italian, *fratino*].

1. **Description.**—The Kentish-plover may be distinguished at all ages by the black beak and legs. The female differs slightly from the male, and there is a seasonal change of coloration. (Pl. XXXVIII.) Length 6·5 in. [153·67 mm.]. The male has a black and white band across the forehead, the white produced backwards over the eye, the lores are black, and there is a black patch on the hinder ear-coverts; the cheeks are white. The crown and nape are of a rufous red. The hind-neck is marked by a white collar blending in front of the white of the under parts. The mantle and wing-coverts are of a pale brown, the major coverts being tipped with white. The median upper tail-coverts are of a darker brown than the back, while the lateral coverts are white. The four central tail feathers are dark brown, the next smoke-brown with white shafts, while the outermost are white. The exposed portions of the primaries are dark brown, the inner webs paler brown, and the shafts

are white, but the innermost primaries are white towards the base of the outer web; the secondaries are dusky brown with white tips, the innermost being also margined with white. The under parts are white, relieved by a black patch on each side of the fore-breast, answering to the black gorget of the ringed-plover. The beak and legs are black. The iris is dark brown. The female differs from the male in having no black on the forehead, and little or no rufous on the crown, while a patch of black on the fore-breast is replaced by a smaller patch of dark brown. In winter the black and red patches on the head, and the black patches on the fore-breast of the male, are wanting. The juvenile plumage resembles that of the female, but the feathers of the upper surface have pale buff fringes. The young in down differs conspicuously from that of the ringed-plover, having the upper parts densely mottled with grey on a buffish white ground. The forehead is white, and the cincture round the occiput is only imperfectly developed; the median stripe down the crown is conspicuous by its absence. [W. P. P.]

2. Distribution.—As a breeding species the Kentish-plover is practically confined to the two counties of Kent and Sussex in the British Isles, being found there on the great shingle beach of Dungeness, and sparingly westward towards Rye and Winchelsea, while a few pairs breed at one other Kentish locality. Of late there has been a decided increase in their numbers, chiefly owing to the cessation of shooting in the breeding season. Outside the British Isles, where it is only a summer resident, it breeds sparingly in S. Sweden and on the south shore of the Baltic, commonly in Denmark, the Frisian Isles, the Low Countries, France, and the Iberian Peninsula, the Canaries, Madeira, Azores, Cape Verdes, and on the shores and islands of the Mediterranean, as well as in the Black and Caspian Seas. It also breeds in small numbers by the larger rivers of Central Europe, *e.g.* in Hungary. In Asia its range appears to extend from Turkestan to E. Siberia and Corea, while local races are found in China and S.E. Asia, as well as in America. Its winter quarters extend to the coasts of tropical Africa, and it has once been recorded from Damara Land, as well as Southern Asia. [F. C. R. J.]

3. Migration.—A summer visitor and a bird of passage. It appears on the Kentish coast usually about mid-April, but sometimes even before the end of March. Flocking takes place towards the end of July, and most of the birds have left by the end of September, October 10 being the latest recorded date for the county (cf. Ticehurst, *B. of Kent*, 1909, p. 425). On the east of England the species occurs in small numbers on migration, chiefly in autumn, presumably on passage to and from Denmark or Sweden (cf. preceding paragraph): Teesmouth is the

northernmost recorded locality (cf. Nelson, *B. of Yorks.*, 1907, p. 576). The Kentish-plover is also an uncommon visitor as far west as Cornwall, and an extremely rare one to the east coast of Ireland. Gregarious: the autumn flocks are composed of both old and young birds, and Waders of other species are frequently consorted with. [A. L. T.]

4. Nest and Eggs.—In Kent the nest is merely a scrape in fairly fine shingle, interspersed with a scanty growth of long, thin grass. On the Continent it is found on shingle-beds, but generally where there are patches of sand, on heaps of sandy mud or seaweed, on depressions in old cattle-droppings, or even on short grass at the edge of mud flats. It is quite common to find the eggs buried point downwards in sand with only the tops showing. There is nearly always a tendency to make use of a slightly elevated site. Sometimes a few bents or broken twigs and stalks serve as apology for a lining. (Pl. xxxvi.) The share of the sexes in nest-making seems not to be recorded. The eggs are typically 3 in number, sometimes only 2, and 4 have been recorded on rare occasions. Dr. Ticehurst (*Birds of Kent*, p. 424) brings forward some evidence that five young have been reared by one pair. In ground-colour the eggs vary from light stone colour to deep brownish ochreous, and are covered with characteristic streaks and scrolls as well as spots. The colour of the shell from within is also a much deeper green than that of the ringed-plover. A rare erythristic variety has occurred in Hungary. Average size of 70 eggs, 1·26 × ·91 in. [32·2 × 23·5 mm.]. Both male and female share in incubation, but in fine weather the eggs are left for long periods exposed to the sun. The period seems not to have been exactly ascertained, but judging from the analogy of the ringed-plover, Naumann's statement that the young are hatched in 15-17 days is probably much below the mark, and incubation probably lasts at least three weeks. In the Mediterranean region eggs may be found by mid-April, but in Kent they are very rarely found before May, and often not till the second or third week in the month. Probably only a single brood is reared as a rule, but where much harassed, eggs may be found up to August. [F. C. R. J.]

5. Food.—Various small marine forms, such as the smaller thin-skinned crustaceans, tiny molluscs, and worms. Insects and their larvæ and pupæ. The young feed chiefly on insects and their larvæ, and are assisted in the search for food by both parents. [W. F.]

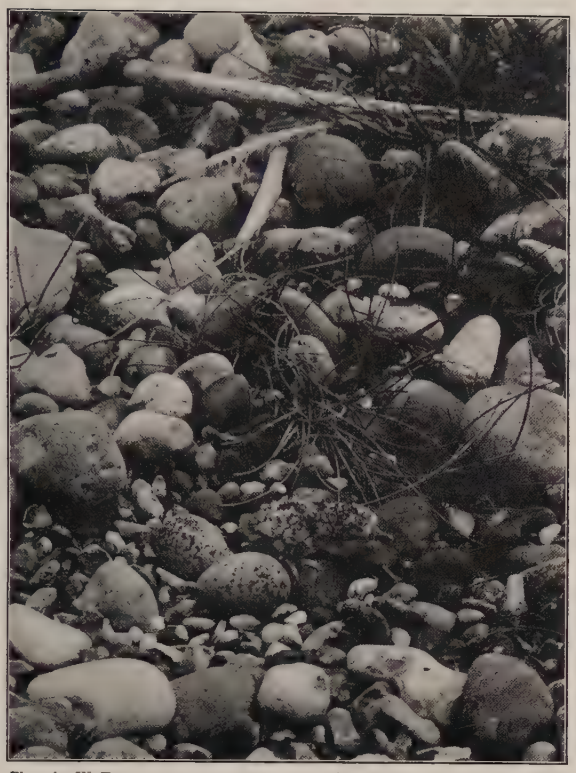


Photo by W. Farren

Kentish-plover's nest and chick

Photo by E. A. Wallis

Golden-plover's nest and eggs

Photo by W. Farren

Lapwing's nest and eggs

Photo by W. Farren

Lapwing's scrape (p. 396)

GOLDEN-PLOVER [*Charádrius apricárius* Linnæus; *Charadrius pluviális* Linnæus. Yellow-plover, sheep's-guide. French, *pluvier doré*; German, *Gold-Regenpfeifer*; Italian, *piviere dorato*].

1. Description.—The golden-plover may be distinguished from its congener the grey-plover by the absence of a hind-toe and the white axillaries. The sexes are alike, and there is a striking seasonal change of coloration. (Pl. XXXIX.) Length 11 in. [279·40 mm.]. The male in nuptial dress has the upper parts black, spangled with gamboge-yellow, the yellow taking the form of spots running round the margin of black feathers; on the hinder scapulars the spots become confluent and form a yellow marginal band. A band of white crosses the forehead, and is continued over the eye, down the side of the neck, and along the upper border of the flanks. The wing-coverts are dark grey tipped with dull yellow, save only the major coverts, which are tipped with white. The tail is dusky, imperfectly barred across the outer web with yellowish white. The sides of the face, and the whole of the under parts below the white line just described, are black, save the under tail-coverts, which are white. The beak and legs are black, the iris hazel-brown. The female differs from the male in having more or fewer white feathers intermixed with the black breast feathers. Towards the end of the summer the yellow coloration of the upper parts is much reduced by abrasion. After the autumn moult the sides of the face and breast are white, and the fore-neck is tinged with yellow and marled by dusky mottlings, while the inner primaries have white, free edges, and the major coverts of the hand are tipped with white. The juvenile plumage resembles that of the adults in winter, but differs in being distinctly more golden above. The fore-neck is mottled with triangular spots of dusky brown, while the flanks are ashy brown with dusky brown bars. The young in down is of a pale golden yellow mottled with black. Two lateral white stripes run over the eye, and similar stripes run down the back. The under parts are white. [W. P. P.]

2. Distribution.—In the British Isles this species breeds sparingly on the moorlands of Devon and Cornwall, and also in small numbers on the Cambrian mountains and the Welsh borders, while it nests locally on the Pennine range and its spurs south to the Peak district in N. Derbyshire. In Scotland it becomes more numerous, and breeds not only on the moorlands of the mainland, but also on the Hebrides, Orkneys, and Shetlands commonly. In Ireland it breeds on the mountains, and in W. Connaught, also in the bogs. Outside the British Isles it nests in the Færoes, Iceland, and possibly Greenland, while it has also been seen in Jan

Mayen in summer. On the Continent of Europe it is common on the fjeld of Scandinavia, and also breeds on the tundra of N. Russia, south in small numbers to Perm and the Baltic provinces. A few pairs nest on the heaths of N. Germany, Denmark, Holland, Belgium, and Luxembourg, while it is said also to have bred in Switzerland. In Siberia its breeding range extends at least as far east as the valley of the Yenisei. In winter it ranges south over Europe to the Mediterranean region, has occurred as a casual on the Azores, Madeira, and the Canaries, and on the west coast of Africa as far as the Gaboon at any rate. Saunders and Seebohm state that it ranges to Cape Colony, but Sclater does not include it among the birds of S. Africa. In Asia it has been met with in Palestine, and thence to Baluchistan and Sind. [F. C. R. J.]

3. Migration.—Found in the British Isles all the year round. That part at least of our breeding birds are resident within our area seems probable, but some may well be summer visitants.[1] The species is also a winter visitor and a bird of passage from Northern Europe in large numbers. A few unmoulted adults reach our shores early in August, and late in September the young birds arrive in large flocks, followed in October and November by the main body of adults, now moulted. The return movement sets in in March, and continues long after our own birds have begun their nesting duties. The golden-plover is a notably gregarious migrant, the birds sometimes associating with lapwings as well as with members of their own species: migration is at times diurnal, but more often nocturnal. The separate migration of old and young seems to have been well established by Gätke (cf. *Vogelwarte Helgoland*, Eng. trans., 1895, pp. 106, 465) and others, but is not an altogether undisputed point (cf. Bonhote, *Ornis*, 1909, p. 168). [A. L. T.]

4. Nest and Eggs.—The nesting-places of this bird are on moors and rough pastures, overgrown with tussocks. Here it breeds sometimes in heather, at other times on the bare ground or in coarse grass, generally slightly elevated, making a depression in the ground, and lining it scantily with bents or bits of heather, or in some cases not at all. (Pl. xxxvi.) Naumann states that the hen makes the depression with her feet. The eggs are normally 4 in number, but clutches of 5 eggs have occasionally been found, apparently laid by one hen. They are pyriform in shape, yellowish stone colour in ground, at times with a rich warm tinge, and rarely greenish white, boldly spotted and blotched with brownish black. Average size of 43 eggs, 2·02×1·35 in. [51·5×34·3 mm.]. The male bird has been shot from the eggs (*Zoologist*, 1883, p. 58), but Saxby states that he has never known the male

[1] A golden-plover marked as a nestling at Bunacton, Inverness-shire, 21st May 1911, was shot about 13th Oct. 1911, in Co. Mayo, Ireland (*Aberdeen University Bird-Migration Inquiry*).

to take part in incubation, though he constantly supplies his mate with food while sitting. The same observer found that a clutch was hatched out in 16 days from when first found warm in the nest, one egg of which appeared to be fresh. Possibly it was really infertile, as W. Evans found that an egg hatched out in an incubator on the 27th day. According to Dr. F. Heatherley's observations, eggs take at least 24 days to hatch under natural conditions (p. 387). Saxby's figures and Naumann's (16-17 days) are no doubt erroneous. The earliest eggs are laid about the second week in April in S. Scotland, and towards the end of the month in the north, and may be found as late as June and early July, but probably only a single brood is normally reared, as in the case of the lapwing, though three to five clutches may be laid by birds whose nests have been taken. [F. C. R. J.]

5. Food.—Inland: worms, slugs, snails, insects—especially beetles—and their larvæ. On the shore: various molluscs, crustaceans, and shore worms. Vegetable matter in small quantities. Stomach analyses prove that the seeds of various plants are eaten, such as *Polygonum* and *Scleranthus* (Naumann), the seeds of the saline, *Glaux maritima* (Yarrell, iii. p. 274), berries and seeds (Dresser, *Birds of Europe*, vii. p. 439, quoting von Droste Hülshoff), old grass seeds (*Field*, 1891, vol. 77, p. 449). Swallows particles of grit. The chicks feed chiefly on insects and their larvæ, and are assisted in the search for food by both parents. [W. F.]

GREY-PLOVER [*Squatárola squatárola* (Linnæus); *Squatarola helvética* (Linnæus). Silver-plover. French, *vanneau-pluvier*; German, *Kiebitz-Regenpfeifer*; Italian, *pivieressa*].

1. Description.—The grey-plover may at once be distinguished, at all seasons, by the black axillaries and the presence of a hind-toe. The sexes are alike, and there is a striking seasonal change of coloration. (Pl. XL.) Length 11·5 in. [280·67 mm.]. The feathers of the crown and occiput are greyish black, obscured by broad white fringes; the hind-neck is white, flecked with grey. The mantle is black, broad white tips to the feathers giving a dazzling black and white barred effect. The wing-coverts have the margins white, the central area of the feathers black, expanding at intervals to form irregular black transverse bars, but the major coverts are grey, margined with white. The primaries are brownish black with white shafts, the innermost quills having a patch of white on the outer web. The upper tail-coverts are white barred with black; while the tail is white crossed by numerous broad bars of black. A broad white band of white runs across the fore-

head above the eye, and down the sides of the neck, at the base of which it considerably expands. This white longitudinal band stands in strong contrast with the jet-black of the sides of the head, the neck and breast, flanks and upper abdomen. The lower abdomen and under tail-coverts are white. Towards the autumn the sparkling brilliance of the contrasted black and white of the mantle is much reduced by the abrasion of the white. The beak and legs are black, the eye dark hazel. The winter dress lacks the black on the face and breast, while the upper surface is of an almost uniform ashy brown, the feathers having a whitish edging, and a more or less distinct subterminal blackish marginal band. There is an indistinct supra-orbital band of white, while the sides of the face have dusky streaks; the fore-neck is of a pale ashy brown with dusky mottlings, while the throat and breast are white. The juvenile plumage resembles that of the golden-plover at the same period, but the black axillaries, white on the innermost primaries, white upper tail-coverts, and more coarsely barred tail, render the two species easily distinguishable. Moreover, the young grey-plover has a hind-toe. The young in down are of a rich golden yellow above, spotted and blotched with black, and white underneath. [W. P. P.]

2. Distribution.—The grey-plover only visits us during the winter months, and on the European Continent its only breeding-grounds are the tundra of North Russia and the island of Kolguev. On the mainland it is known to nest on the Kanin Peninsula and the Lower Petchora. In Northern Siberia it breeds on the Yalmal Peninsula, the Taimyr, and the valleys of the Lower Yenisei and Kolyma. The first discovery of the breeding haunts of this species was made by von Middendorff in 1843, on the Boganida, and Seebohm and Harvie-Brown were the first to find it nesting in Europe, on the Petchora, in 1875. It also breeds in Arctic North America. During the winter months it migrates southward through Europe and Asia by definite routes to Africa, along both sides of the continent south to Cape Colony and Natal, as well as to the Canaries, Azores, Cape Verdes, and Madagascar. In Asia it ranges to the shores of the Indian Ocean, Borneo, the Philippines, New Guinea, and other islands of the Malayan Archipelago, as well as to the Solomon Isles and Australia; while North American birds winter in the West Indies, Brazil, and Colombia. It will thus be seen that, with the exception of the southern part of the American continent, there is no part of the temperate or tropical world which is not visited by this truly cosmopolitan species. [F. C. R. J.]

3. Migration.—A bird of passage and a winter visitor from Northern Europe. A few unmoulted adults may be recorded at the end of July or the beginning of August. In September the main movement, that of the flocks of young

birds, reaches our shores, followed in October and November by the adults, now moulted, in smaller numbers. Most of the birds pass on, but a few remain with us for the winter. The return passage lasts till late in May, and a few non-breeding birds may remain till July. A gregarious, and, to a great extent at least, a nocturnal traveller. [A. L. T.]

4. Nest and Eggs.—Does not breed in the British Isles. [F. C. R. J.]

5. Food.—Insects and their larvæ; worms, molluscs, and crustaceans, such as small shell-fish, shrimps, and sandhoppers. Also eat a good deal of vegetable matter, such as seaweed. "Small fish" (Patten, *Aquatic Birds*, p. 233), "grasshoppers and other insects, as well as berries of various kinds" (Macgillivray, *British Birds*, iv. p. 92). The food of the young consists chiefly of insects—especially mosquitoes—and their larvæ. They are assisted in their search for it by both parents. [W. F.]

LAPWING [*Vanéllus vanellus* (Linnæus); *Vanellus vulgáris* Bechstein. Peewit, peeswipe, green-plover; happinch, lappinch (Cheshire); hornpie (Suffolk); horniewink; tieves' nicket (Shetlands). French, *vanneau huppé*, *dix-huit*; German, *Kiebitz*; Italian, *pavoncella*].

1. Description.—The lapwing may be readily distinguished by its recurved crest of erectile feathers. The sexes are alike, and there is a slight seasonal change of coloration. (Pl. XLI.) Length 13 in. [330 mm.]. The adult, in nuptial dress, has the top of the head, including the recurved feathers of the crest, the lores, fore-part of the cheeks, a line under the eye, throat, and fore-neck black, glossed with green; while the eyebrow, sides of the face and neck, are dull white. The mantle is of a rich metallic coppery green with purple reflections, while the wing-coverts are of a deep steel blue-black with a metallic sheen. The primaries are black, the three outermost with greyish white tips. The upper tail-coverts are of a reddish chestnut, while the tail has the basal portion white, the rest black, but the black area decreases from the middle feathers outwards, so that the outermost feather is nearly all white. The under surface, from the black gorget backwards, pure white, save the under tail-coverts, which are of a pale cinnamon. The male differs from the female in having a conspicuously longer crest, and in the shape of the wing when expanded, which is thus much broader and more rounded than in the female. After the autumn moult the black on the throat disappears. The fledgling resembles the adult in winter, lacking the black throat; but it may always be distinguished by

the fulvous margins to the feathers of the upper surface. Young in down are of a pale reddish brown above, spotted and blotched with black; there is a dark band across the breast, and the rest of the under parts are white. [W. P. P.]

2. Distribution.—In the British Isles the lapwing is mainly resident, or only subject to local movements, and is very generally distributed on the whole, except in some districts of the south of England. In the north of England, as well as Scotland, Ireland, and the adjoining islands, it is still very numerous. A few pairs breed on the Færoes, but not on Iceland, and on the Continent it ranges in Norway to about the middle, and in Sweden to Upland, but has bred to beyond lat. 68° on the Muonio river (S. A. Davies); in Finland to over lat. 61°, and in East Russia to 62°. Southward its breeding range extends on the west to Andalucia and Marocco, and in Eastern Europe to Macedonia, but not to Greece, though a few are said to breed in Egypt. In Asia it is found up to 57° on the Ob, and though absent from the Lena valley is common in Dauria and Ussuria (Buturlin); southward it is found on the Tian Shan range to about eleven thousand feet, and in small numbers in Transcaspia. On migration it passes over Europe to the Atlantic isles and the Mediterranean basin, wintering on both sides, and in Asia south to Asia Minor, Persia, N. India, Burma, China, and Japan. It has also occurred casually on Jan Mayen, Greenland, Iceland, Newfoundland, Nova Scotia, the Bahamas, and Barbados, as well as in Alaska. [F. C. R. J.]

3. Migration.—A summer visitor to a great many inland districts, but found all the year round on most parts of the coast. To our area as a whole some individuals are summer visitors, some winter visitors, and some birds of passage; still others are doubtless resident within its limits. The complicated movements have been worked out by Mr. Eagle Clarke, upon whose report (*British Association Report*, 1902, pp. 277-283) the following summary is based.

(1) *British Summer and Autumn Movements.*—"Flocking" takes place at the close of the nesting season, and in July or even late June slight movements of a more or less erratic nature may be observed. In August the birds begin to leave the more northerly parts of our islands, and it may be noted that in the northern isles there is an interval between the departure of the last summer visitors and the arrival of the first overseas immigrants. In September the southward movement within the British Isles is in full swing; in October it reaches its height, but it persists till mid-November. By October the higher inland districts are practically deserted for the winter. The movements within our area include an immigration to Ireland from Scotland in October and November: it takes place

mainly from the coast between the Mull of Cantrye and the Solway Firth to that of counties Antrim and Down, and also by way of the Outer Hebrides to the coast of Donegal.

(2) *Autumn Immigration from North-Western Europe.*—This immigration takes place from early October to mid-November. It affects the east coast of Scotland from Shetland southwards, and the northern section of the east coast of England, but movements affecting a great stretch of coast-line simultaneously do not usually occur. The total number of immigrants is not very great, for the species is by no means abundant in North-Western Europe (see preceding paragraph).

(3) *Autumn Immigration from the East.*—In October and early November an immigration from the east and south-east takes place on the coast between the Thames and the Wash and the Humber.

(4) (*Passage Movements*).—There is no evidence of immediate southward emigration of immigrants from either source. The majority certainly remain within our area for some time, although many must eventually cross the Channel.

(5) *Autumn Emigration.*—There is no evidence of any cross-Channel emigration in September or October, although the existence of slight movements of this nature is not improbable. Considerable emigration takes place in November, the movements being sometimes associated with general movements down the east and west coasts of England.

(6) *British Winter Movements and Winter Emigration.*—The lapwing affords an exceptionally good example of winter movements subsequent to the ordinary migration season. These movements are indeed of a far more general and striking character than the autumnal migrations, but their extent and the time of their occurrence depend entirely on the severity of the season. In seasons where no very severe weather has occurred till late in the winter, we find cross-Channel emigration taking place in the middle of February, and southward movement within the British Isles as late as mid-March.

(7) *Winter Immigration from West-Central Europe.*—In severe winters the winter movements in West-Central Europe give rise to an immigration on the southern section of the east coast of England, the birds afterwards spreading westwards across the country.

(8) *British Spring Movements.*—Some birds return to their inland haunts at the end of January or in February, but very often have to beat a temporary retreat. The normal time for returning to summer quarters is between the end of February and the middle of March, except in very late seasons. These movements include

a return journey from the north-east of Ireland to the west of Scotland. There is also a *south-easterly* emigration from Wexford at the end of February: the autumn counterpart of this movement has not been recorded, and it is also uncertain whether it is English or Continental birds that participate.

(9) *Spring Immigration from Southern Europe.*—This movement is the counterpart of the southward movements mentioned under (4), (5), and (6), but it is very inconspicuous. It occurs in the latter half of March.

(9*a*) *Spring Return to Ireland.*—From late February to early April lapwings are recorded crossing from the south of England in a north-westerly direction to the south-east of Ireland, although no corresponding south-easterly migrations have been noted in either autumn or spring. It will be remarked that lapwings cross the Irish Channel at the end of February in two opposing directions (cf. (9)).

(10 and 11) *Passage and Emigration to North-Western Europe.*—This combined movement begins at the end of February or the beginning of March, and lasts till the middle of April, after which only stragglers are noted on migration. The movements affect both coasts of Great Britain and also the Northern Isles; a certain amount of overland crossing also takes place.

(12) (*Emigration to the East*).—A counterpart of (3) and (7) doubtless exists, but has not yet been recorded.

Little can be added to this statement from other sources of information. A point it leaves unsettled is the extent to which British and Continental-bred birds respectively participate in the southward emigratory movements. Bird-marking may in time provide an answer to the question: a few interesting records are already available, and may be briefly cited. The following are the dates and localities of the subsequent recovery of lapwings marked as young in the north-east of Scotland (Aberdeenshire and Kincardineshire) in the summer of 1910 (cf. Thomson, *British Birds*, vol. v. p. 99; etc.) :—

Oct. (?) 1910, 20 miles N. of Oporto, Portugal.
About 18 Nov. 1910, Thurles, Co. Tipperary, Ireland.
About 22 Nov. 1910, Frenchpark, Co. Roscommon, Ireland.
29 Dec. 1910, Elvas, Alemtejo, Southern Portugal.
About 5 Feb. 1911, Mitchelstown, Co. Cork, Ireland.
13 Feb. 1911, Croagh, Co. Limerick, Ireland.
About 1 Jan. 1912, Grangemore, Co. Roscommon, Ireland.

We may give two further records of lapwings marked as young in Stirlingshire (cf. Witherby, *British Birds*, vol. iii. p. 251, and vol. iv. p. 336) :—

(Marked 1909) 17 Nov. 1909, Aranjuzon, Basses Pyrénées, France.
(Marked 1910) 28 Feb. 1911, Gouran, Co. Kilkenny, Ireland.

As regards habits: the lapwing is notably gregarious, and the migratory flocks are sometimes of immense size. The majority of the movements are executed at night, although diurnal migration also occurs, but the species is seldom recorded among the victims of the lighthouse lanterns. [A. L. T.]

4. Nest and Eggs.—The nest is placed on open ground, whether pasture, ploughland, moor, or marsh, and is generally on slightly elevated ground rather than in the depressions. As a rule it is a saucer-like hollow in the ground, scantily lined with a few bits of bent, though some nests are much better lined than others. (Pl. xxxvi.) Generally other "false nests" are to be found close at hand, which are apparently the work of the cock bird (see Saunders, *Manual*, p. 556; S. E. Brock, *Zoologist*, 1911, p. 296). The eggs are normally 4, but there seems to be no doubt that 5 are occasionally laid by one hen, and they are generally deposited on alternate days. They do not vary much as a rule in appearance, being pyriform in shape, and stone colour to olive brownish in ground-colour, more or less thickly spotted and blotched with black, sometimes showing ashy shellmarks. Occasionally eggs are found with a band of greenish more or less clearly defined, and some eggs are greenish blue, very sparingly marked. A rare and very beautiful variety has brownish red markings on a warm ground. Average size of 66 eggs, 1·83 × 1·31 in. [46·7 × 33·4 mm.]. Incubation is performed by both sexes (Farren and others), but probably the greater part of the work is undertaken by the hen. J. v. Wangelin (Naumann, *Vögel Mitteleuropas*) asserts that the male takes no part, but this appears to be incorrect. Naumann gives the period as 16 days, obviously an error, as H. S. Gladstone estimates it at 26 days, and W. Evans found that the young were hatched out on the 25th, 26th, and 27th days (*Ibis*, 1891, p. 80). The first eggs are laid towards the end of March, but frequently not till the beginning of April, and one hen will lay as many as twenty eggs in a season if persistently robbed, so that under these circumstances fresh eggs may be found in June and even in July, but the lapwing is single-brooded. [F. C. R. J.]

5. Food.—Chiefly worms, slugs, snails, insects of various kinds—especially beetles—and their larvæ and pupæ. And on the coast various molluscs and crustaceans. Fragments of sea-weed (Patten, *Aquatic Birds*, p. 238). Mr. J. E.

Harting examined the stomachs of many birds, and found that those from grass-land on sandy soil had fed chiefly on beetles; while in the stomachs of those from downland where the soil was chalky, fragments of small snails, *Helix virgata* and *H. caperata*, were found (*Ibid.*, p. 238). Swallows particles of grit. The young are attended by both parents, and assisted by them in their search for food, which consists chiefly of insects and their larvæ, small worms, spiders, and tiny molluscs. [W. F.]

1. THE DOTTEREL

[W. Farren]

Although never very numerous as a breeding species in this country, the dotterel has decreased in numbers so considerably during the last half-century or so, that it is now one of the very rarest of our nesting Waders. This appears to be due not so much to persecution in its nesting-haunts—although, being a rare bird, its eggs have always been much sought after—as to the fact that great numbers used to be killed on the spring migration. Apparently the British nesting birds do not follow a coast-line on migration, but pass along the eastern and midland counties to their breeding-haunts on the hills of the north of England and Scotland. They have well-known halting-places where they stay for a few days, feeding and resting before continuing their northward journey. These resting-places extend from Sussex and Berkshire to Wiltshire, but not farther west. One of the most famous localities in former years was the line of low chalk hills running from the borders of Hertfordshire and Essex through East Cambridgeshire, bordering the fen district to the brecklands of Suffolk and Norfolk. There are others in Lincolnshire, Yorkshire, Derbyshire, and farther north.

To such localities, regularly in the beginning of May, the dotterel came in "trips," *i.e.* small parties of from five to twenty or more birds, and although the earliest arrivals passed on after a few days, others took their place, and for about a fortnight they might be found in considerable numbers scattered over the arable land and chalk-downs. Being at this time very tame and fearless, they fell easy victims to the fowlers, who took large numbers in nets, which were spread much after the manner of the nets used by birdcatchers at the present day. Dotterel were greatly esteemed for the table,

selling at as much as six and seven shillings a couple; even a modest proportion of that amount which would fall to the share of the fowlers would have been sufficient inducement for them to kill as many as possible during the short season.

Their feathers were largely in demand for making artificial flies for fishing, and probably as many were killed for this purpose as for the market. They were very regular in their arrival at these resting-places, so much so that in different localities the 9th, 10th, or 12th of May was known as "dotterel day." And on these dates they were eagerly awaited. They were called dotterel, and *morinellus*, because of their tameness or indifference, which was so marked as to be regarded as foolishness. It was a poor reward for their lack of fear of man, to be christened fools first and then killed. They have either learnt a little wisdom since, and altered their route of migration, or more probably the race that visited this country paid the penalty of foolishness by being all but exterminated, as so few come now to the old localities that they pass almost unnoticed.

Had the "Wild Birds Protection Act" and the "close" season come a little earlier, it might have made all the difference to the dotterel as a nesting species in this country. Previous to the Act there were always dotterel in Cambridge market in May; even in the early years of the close season I have seen them exposed for sale, but as it was gradually made plain to game-dealers that the Act really made it illegal to handle even "ordinary wild birds" during the close season, they were no longer exposed, although they were still occasionally brought to market and sent to certain old-fashioned customers, with whom the fashion of eating dotterel in May died hard, just as the fashion of eating plovers' eggs is dying hard at the present day.

The history of the dotterel in this country goes back to the sixteenth century, and Yarrell quotes some quaint old descriptions of the methods of the fowlers in taking them. There was a curious supposition that the birds imitated the actions of the fowlers, and that this habit assisted in their capture. Dr. Key sent to Gesner a description,

which is cited in his *Historiæ Animalium*, lib. iii. p. 615 (1585), and is rendered by Willughby as follows: "It is taken in the night-time by the light of a candle by imitating the gesture of the Fowler: For if he stretches out an Arm, that also stretches out a Wing; if he a Foot, that likewise a Foot: In brief, whatever the Fowler doth, the same doth the Bird; and so being intent upon men's gestures it is deceived, and covered with the Net spread for it." No doubt the dotterel stretch out their wings and legs—not in imitation of the fowlers, but as birds generally do when disturbed from a period of rest, as opined by a gentleman of Norfolk, whose account of dotterel netting given to Willughby's "very good friend Mr. Peter Dent of Cambridge," includes the following: "The Birds being awakened do often stretch themselves, putting out a Wing or a Leg, and in imitation of these, the men that drive them thrust out an Arm or a Leg for fashion sake, to comply with an old custom."[1]

The history of the dotterel is, however, by no means entirely of the past, and although they come in such small numbers as generally to escape notice, they are occasionally recorded as being seen about the old resting-places in early spring. Dr. Ticehurst considers it doubtful whether the numbers that now use the route through Kent are "more than can be counted on the fingers of two hands." A few, however, are regularly observed, and these, he thinks, are probably part of the actual British breeding stock.[2] A trip of eighteen birds was seen by Mr. Aplin in Oxfordshire on April 27, 1892, and he wrote to the *Field* an interesting account of their habits. They never once, while under observation, moved from a fifteen acre field of young barley. They were tame, allowing as near an approach as thirty yards. Nearer than that the birds began to run very fast—Mr. Aplin described them as quicker runners than any plover he knew,—and if pressed they flew up with sharp whistles, circled round, and settled farther off. They fed in "loose order" with the usual plover-like action, running a few steps and then stopping abruptly to pick up something. They stood

[1] Willughby, *Ornithology*, p. 309.

[2] Ticehurst, *Birds of Kent*, p. 416.

high on the leg, but ran in a crouching attitude. They resembled the golden-plover on the wing in shape and size, flying and wheeling beautifully together. The call-note Mr. Aplin described as a fairly soft rather twittering whistle, "*wit-e-wee, wit-e-wee, wit-e-wee,*" not so mellow as that of the golden-plover, but still very sweet. When tired of being repeatedly put up, they at last rose high in the air and went off in a north-easterly direction, "the usual Wader spring route."[1]

Writing in 1885 on the migration of the dotterel, Mr. John Watson, of Kendal, states that recently made records add nothing, but confirm what has previously been known, viz. that they arrive in this country towards the end of April and early in May. After recruiting for a time on the east coast marshes, they strike inland for the ranges of hills forming the backbone of the six northern counties, and passing along this chain of hills remain to breed on some of them.[2] With regard to the above reference to the dotterel frequenting marshes on the east coast, there was a long controversy in the *Field* in 1887[3] as to whether the dotterel was ever found in marshes. It arose out of a letter from Mr. F. Boyes, questioning the correctness of Howard Saunders' statement that on the spring migration, dotterel, after resting a few days on the chalk-wolds, "descend to the marshes on the Lincoln and Yorkshire coasts, and remain there till about the end of the third week in May, when they leave for their breeding-grounds."[4] It was chiefly a difference of opinion—one might almost say a quibble—as to what is implied by "marsh." Mr. Boyes took it to mean a wet swamp, which was taking an unnecessarily extreme view, and it was made quite clear by the various correspondents of the *Field* that dotterel certainly do frequent marshes, such as the drier salt-marshes, Romney marsh in Kent, and the "mosses" in the estuary near the mouth of the Ribble in Lancashire.

The birds referred to by Howard Saunders as remaining in Lincoln and Yorkshire till the end of the third week in May are

[1] *Field*, 1892, vol. lxxix. p. 665.
[2] *Ibid.*, 1885, vol. lxvi. p. 708.
[3] *Ibid.*, 1887, vol. lxx. pp. 635, 754, 778, 829.
[4] Yarrell, *British Birds*, 4th ed., vol. iii. p. 252.

probably on their way to breeding-grounds outside the British Isles, as by that time most of our home birds are settled down; and although egg laying does not become general until June, yet eggs have been found, though exceptionally, from about May 23rd. The number of birds that now nest on the Cumberland hills and other parts of the Lake District is undoubtedly very small, but in Scotland there may be more than is generally supposed. The nesting-places are seldom at a less altitude than a thousand feet, and generally considerably more, varying from 2000 to 4000 feet. Heysham, whose account of their nesting-habits on the Cumberland hills, which first appeared in the *Magazine of Natural History*, ii. p. 295, and has been quoted in most of the histories of British birds published since, stated that "the most favourite breeding-haunts of these birds are always near to or on the summit of the highest mountains, particularly those that are densely covered with the woolly fringe-moss, *Trichostomum lanuginosum*." The Rev. H. A. Macpherson, however, says they do not select the summits of the highest mountains, nor do they lay where the fringe-moss grows, but upon short dense grass a little below the summit.[1] The latter agrees with the observations of others who have visited the nesting-places of the dotterel in Scotland. The majority breed on barren slopes and plateaus just below the summits of the mountains.

Although Heysham's observations were made as long ago as 1833 to 1835, very little in the way of fresh information on the habits of the species has been added since. Observation is naturally attended with considerable difficulty, owing to the remoteness of its nesting-places, and even if these are visited, the scarcity of the species renders it a matter of uncertainty as to whether the birds will be met with.

Nothing appears to have been recorded relating to the period of courtship, or as to whether the birds have paired before their arrival on the nesting-grounds. The nest is a very slight cavity in the ground, and is very scantily lined. It has been stated that the nest contains

[1] *Birds of Cumberland*, p. 133.

no lining whatever, and that the hollow is simply pressed down, not scraped out.[1] Nests would appear, however, to vary in this respect, as two found in one day in Scotland were "lined with a plentiful supply of red cranberry leaves,"[2] which must have been brought from some distance. It is not certain whether the dotterel makes additional scrapes or "false nests." The finding of one has been recorded,[3] which in itself is hardly sufficient on which to make a general statement. Mr. G. G. Blackwood, who has spent much time watching dotterel in the nesting season, informs me (*in litt.*) that he has never found a "false nest," but he adds "the actual nest is so slight that a false one would be very easily overlooked."

The dotterel lays three eggs, and, as is usually the case when a species of the Wader group lays less than four, these are less acutely pyriform than the common type of the family. The clutch seldom—probably never—exceeds three in this country, but four eggs were found in a nest by Dr. Walter in the Taimyr Peninsula.[4] According to Heysham, the dotterel is by no means solitary in the nesting season, a few pairs generally associating together, but the Rev. H. H. Slater, who visited their haunts in Northern Europe, states that two nests are rarely within a mile of each other.[5] The latter is almost certainly the case in Great Britain at the present time, whatever it may have been in Heysham's time. The Rev. H. H. Slater found two males incubating during the day, and thought it probable that they do so almost entirely, the females merely relieving the males when the latter leave to feed.[6] Gloger also found the male incubating,[7] and Mr. Blackwood thinks that the female bears no share in the duty. He adds, however, that it is not at all easy to distinguish one sex from the other, in spite of the assertion that the female is the brighter of the two. There is no doubt a good deal of individual variation, and I do not think that the full breeding plumage is assumed by year-old birds,

[1] J. A. Harvie-Brown, *Proc. Nat. Hist. Soc. Glasgow*, ii. p. 237.
[2] *Field*, 1902, vol. xcix. p. 942.
[3] J. A. Harvie-Brown, *op. cit.*
[4] *Ibis*, 1904, p. 229.
[5] *British Birds, their Nests and Eggs*, v. p. 66.
[6] *Ibid.*
[7] Naumann, *Vögel Mitteleuropas*, viii. p. 50.

Dotterel and young

By A. W. Seaby

therefore an old male mated with a young female might look much alike. It is also doubtful whether the full breeding plumage is assumed by all the British-breeding birds. The few birds I have dissected showed a very decided advantage both in size and colour in favour of the female. With regard to the incubation period, Heysham gave it as 18 to 20 days, and a similar time—probably copied from Heysham—is given by Naumann. Judging by the average time taken by other species of Waders, it is probably longer than twenty days. Until the young are hatched, the old birds are shy and retiring, leaving the nest, as a rule, while an intruder is still a long way off, but some individuals sit fairly close, and sometimes a bird shows unconcern for its own safety when its nest is discovered. Heysham stated that they are very silent during incubation, although when the young are hatched they fly to and fro over the head of an intruder, uttering an alarm-note. He related of three or four pairs observed on Robinson on the 3rd of July that they were very tame, allowing a near approach without showing any symptoms of alarm. "Some would move slowly about and pick up an insect, others would remain motionless, now and then stretching out their wings, and a few would occasionally toy with each other, at the same time uttering a few low notes, which had some resemblance to those of the common linnet." One bird, put off its eggs, "immediately spread out its wings and tail, which it trailed on the ground a short distance, and then went away without uttering a single note."[1] This habit would appear to be quite usual, and has been several times recorded by more recent observers. Mr. A. Buxton, who found dotterel nesting on a moss-covered plateau on a hill in Scotland in 1906, thus describes the action of a bird when put off the nest: "She put her bill on the moss, spread and stiffened her wing and tail feathers so that their tips touched the ground, and then proceeded to balance herself on her throat, squeaking all the time and kicking out her legs in the air behind her." This took place while Mr. Buxton

[1] *Magazine of Natural History*, ii. p. 295.

was quite near. She then stood up, and on his walking up to her, "she fluttered away with wings and tail spread, just out of reach, for 30 yards, and then shut herself up like an umbrella, and walked to the top of a mound and stood quietly watching." Mr. Buxton and his companion then lay down quite near, and watched her, as she, after a few sidelong glances, ran back to the eggs and settled on them immediately. When on the nest the bird was heard to utter a low note "like a meadow-pipit squeaking very softly." It allowed itself to be almost touched before moving from the nest, and then went through the same performance as before. It was apparently taken for granted that this bird was a female. Before the nest was discovered, its mate was seen flying in a large circle, uttering a monotonous metallic whistle, "*peek-peek-peek*," which was believed to be its love-song.[1]

Another observer described a dotterel as approaching its nest very circuitously, cowering and doubling in and out among stones and mounds of moss. When put from the nest it ran straight away. The same observer wrote: "I know of no bird that seems to lose itself in its environment more completely than the dotterel, unless it is the Kentish-plover, on the flint and shingle of the beach." He also noticed that the bird was more indistinct when running away, showing a back view, than when head on.[2]

With regard to the notes of the dotterel, it is difficult to reconcile the various renderings. The above "*peek-peek-peek*," and Mr. Aplin's "*wit-e-wee, wit-e-wee, wit-e-wee*" (*ante*, p. 358), may be the same note. Mr. Blackwood (*in litt.*) describes the commonest call by breeding birds, and also by birds on passage, as resembling the regular creak of an unoiled wheel-barrow. This would agree with the "*peek-peek.*" Turning to Naumann, we get an entirely different impression. He describes it as somewhat softer than that of the golden-plover, a pleasant "*drrr*," in which can be heard the *ü*, so that it becomes "*drrü*" or "*dürr.*" And he states that the birds can be attracted by this note made with

[1] *Field*, 1906, vol. cviii. p. 2.

[2] *Ibid.*, 1902, vol. xcix. p. 942.

a whistle. Another note he renders "*düt, düt, düt, düt*," from which note the bird is known as dütchen. A dotterel that was put off its nest by Gloger uttered a soft pleasant sounding trill, "*sisihririri.*"[1]

Gloger found the dotterel nesting on barren mountain-tops 4000 feet high, on the borders of South Germany between Bohemia and Silesia, but there it has now become very rare.[2] Its nesting range extends from North Britain across Northern Europe and Asia to the Pacific. It has been found as far north as Novaya Zemlya, and at 74° N. lat. in the Taimyr Peninsula. It winters in large numbers in Palestine and North Africa, but apparently not much farther south. (For details see "Classified Notes.")

The autumn migration of old and young birds generally takes place in September, but they have not been so regularly observed at this time on the chalk-wolds as in the spring. They probably keep more to the coast-line. The autumn passage is generally well over by the end of October, but there is a record of one bird shot out of a flock of one hundred or more on November 29, 1905, on a tidal estuary in Donegal.[3] The birds were at first mistaken for golden-plover. The fact of one being shot should leave no doubt as to their identity, otherwise the lateness of the date, and the fact that the species has seldom been observed in Ireland, might have allowed a reasonable doubt as to the correctness of the identification. Large numbers have been recorded as passing over Heligoland in the end of August and early in September.[4]

[1] Naumann, *Vögel Mitteleuropas*, viii. p. 50.
[2] *Ibid.*
[3] *Field*, 1905, vol. cvi. p. 995.
[4] Yarrell, *British Birds*, vol. iv. p. 253.

2. THE RINGED-PLOVERS

[W. Farren]

Of the two species of this group of plovers which nest in the British Isles, one, the common ringed-plover, is resident on our coasts during the whole year, and is one of the commonest and prettiest of our shore birds; while the other, the Kentish-plover, is a summer migrant, rare and extremely local, nesting chiefly on the pebble beach at Dungeness in Kent, and more rarely in one or two other localities in Kent and Sussex.

The ringed-plover is common throughout the year on the coasts all round the British Isles, diminishing in number somewhat in winter in the most northern parts. It is resident on suitable coasts in most parts of the Continent, and is a summer visitor to Greenland and other Arctic localities. On the other hand, the range of the Kentish-plover is considerably more southern. The British localities mentioned above are, however, not its most northern limit, as it breeds in South Sweden and Denmark. It is, however, more numerous farther south, and is resident on the shores of the Mediterranean, in South-western Europe, North Africa, and the adjacent groups of islands. It is more partial to the shores of inland lakes and rivers than is the ringed-plover. In winter both species have been found as far south as Damara Land in Cape Colony. The Kentish-plover also frequents many parts of Asia down to India and the Malay Peninsula. A small race of the ringed-plover occurs in Central Asia and also Northern Africa, moving down to the Cape in winter. This small race visits the Norfolk and Kent coasts on the spring migration, but although it was thought by Howard Saunders to breed occasionally in the latter county,[1] Dr. Ticehurst has never been able to identify it as doing so.

[1] Howard Saunders, *Manual of British Birds*, p. 539.

Partial as is the ringed-plover to the seashore, in the breeding season it resorts in small numbers to certain inland localities, such as the shores of lakes and the shingle islands in rivers. It also breeds in fair numbers in the Breck district of Suffolk and Norfolk. Here it nests on the more flint-covered parts of the warrens, and also on the sandy fields. It arrives in the Breck district in March, and commences to nest almost at once, eggs being frequently found in the first week in April, and I have seen the young hatched out on the 23rd of that month. The date of the commencement of egg-laying may vary in different localities. Probably the inland-breeding birds start earlier than those on the shore. According to the observations of Mr. J. Hepburn, egg-laying commences on the North Kent coast in the first week of May.[1] But the same observer found nestlings on the beach at Dungeness on May 10. The eggs from which these were hatched must have been laid about the middle of April.

I do not think that it is by any means the rule that more than one brood is reared in a season. I have found young ringed-plovers hardly able to fly, and with the down still on their heads and backs, on the Norfolk coast in August and September, but such late broods are probably due to the first nests having been destroyed. Stevenson thought that some of the ringed-plovers which arrive from the south with knots and other Waders at Breydon in mid-May, stay and breed with us, and account for the late broods.[2]

The Kentish-plover generally arrives on the Kent coast about the middle of April, although in mild seasons it occasionally appears at the end of March. The few weeks prior to the nesting season are spent in flocks on the sandy shore, with occasional visits to the marshes.[3] In May they resort to the shingle beach for nesting purposes, laying their eggs in a slight depression, either natural or formed by themselves. Like all Waders, both species seldom depart from their normal number of eggs in a clutch. I have found five eggs

[1] *Zoologist*, 1904, p. 169.
[2] *Birds of Norfolk*, vol. ii. p. 91.
[3] Ticehurst, *Birds of Kent*, p. 425.

in a nest of the ringed-plover, and in May 1911 I saw a clutch of four Kentish-plover's eggs in the marismas of Southern Spain. The last-named species normally lays three eggs, and—following a general rule when any of the *Limicolæ* depart from the traditional number of four eggs—these are less pyriform than the usual type of the family, seldom showing a sign of constriction towards the small end. They differ also from those of the ringed-plover in having markings of a peculiar scrawly type. In this country laying usually commences after the first week in May, but it may be earlier in favourable seasons. A nest of eggs was found on April 25, 1902, and another on May 5.[1]

Both species have been described as occasionally arranging the eggs with the small end down, embedded in the sand.[2] Mr. Jourdain stated that eggs of the Kentish-plover found abroad, and laid on sand, were thus placed.[3]

The nests of both species vary according to the nature of the ground. I have seen the eggs of the Kentish-plover on Dungeness beach among pebbles as big or bigger than the eggs, and here the hollow in which they were laid may have been a natural one, or some of the stones may have been displaced by the bird. Other nests, among smaller shingle where much fine wiry grass was growing, were undoubtedly hollows formed by the bird. Some contained a few pieces of dead grass by way of lining. The latter, according to Mr. Dombrain, is the most usual situation. He states also that the first egg is laid on the shingle, and the nest is formed as the clutch is completed, and when incubation is in progress. He also found eggs laid on a heap of seaweed.[4] Mr. Hepburn found a nest "thickly lined with short, broken pieces of rotten twigs and sticks."[5] Baron von Droste Hülshoff found the Kentish-plover common in the Island of Borkum. The nests were on thickly overgrown dunes, as well as on bare ground. They were often placed in the middle of a bunch of

[1] *Field*, 1902, vol. xcix. p. 678; also Howard Saunders, *Manual of British Birds*, p. 544.
[2] *Field*, 1903, vol. cii. p. 227.
[3] *Ibid.*, p. 405.
[4] *Zoologist*, 1880, pp. 138, 139.
[5] *Ibid.*, 1903, p. 217.

wild oats or amidst willow shoots, and lined with a few bents or fine roots. Some of the nests were not more than ten paces apart. The pairs live in amity, and join in crying when disturbed.[1] In the marismas of Southern Spain, where the Kentish-plover is common, the eggs are laid in a very slight hollow on the mud, which may be soft on the edge of the flooded parts, or hard and sunbaked.

The nest of the ringed-plover is a better defined hollow, and varies considerably in the nature and quantity of the lining. Most frequently this consists of small stones and broken shells. But almost any convenient material may be utilised, pieces of driftwood, a little dry grass or other vegetable matter, and occasionally rabbit droppings.[2] Colonel H. W. Feilden found four nests at Wells in Norfolk, each substantially made of the green leaves and stems of *Atriplex litoralis.* These nests were on mud in the salt-marsh; others, not a quarter of a mile away, on the sand and shingle, were lined with stones and shells in the more usual way.[3] A very interesting nest was described by Dr. Kelso in the *Zoologist.* It was found on May 26, 1900, in a field, and was like a miniature lapwing's nest, very substantially built with dry bents. It contained three eggs, which were taken, as the field was about to be harrowed. On June 14th an exactly similar nest was found a short distance from the site of the first, on a piece of rough grass, evidently the work of the same pair of birds. A reproduction of a photograph of this nest accompanied the description, and shows the nest to have been a remarkable structure for the species.[4] Out of nineteen nests found by Mr. J. Hepburn in Kent, one was at the base of a river wall "separated by about one hundred yards of salt-marsh from the beach, the nest-hollow being quite thickly lined with the leaves of the sea-heath growing on the saltings." Another was "by the side of a road made up of cinders and household refuse, running across one of the saltings." This nest "was paved entirely with small pieces of earthenware, evidently picked off the track." The

[1] *Vogelw. Bork.*, pp. 154, 157.
[2] *Zoologist*, 1891, p. 44.
[3] *Ibid.*, 1889, p. 263.
[4] *Ibid.*, 1902, p. 28.

remaining nests were normal beach nests, except that five of them were "under the shelter of little bushes of sea-heath—which grows on the beach in small clumps to the height of about twelve inches—the nest-hollow being so much under the edge of the bush as to be partially concealed by its stems."[1]

A photograph by Dr. Heatherley of a nest similarly placed on the beach at Wells was reproduced in the *Zoologist*, 1904, p. 365. Dr. Kelso has found nests hidden among coarse shore grass, and also in fields of sprouting wheat, peas, etc. Before the eggs in these nests have hatched, they have become hidden by the growth of the crops.[2]

The nest cavity is frequently formed so that a large stone or shell comes on the edge. By far the commonest form of nest has a lining or paving of small stones of uniform size. In the Breck district of Norfolk and Suffolk I have never seen a nest without this form of lining. Here the cavity must always be made in sandy soil, for although in most parts there are many flints both on the surface and mixed with the soil, there is nothing like the shingle of the seashore. These nests on the warrens of the Breck are far easier to see if without eggs. The formal saucer-shaped depression, with its neat paving of small stones, is quite conspicuous, even at a distance; but the four eggs, arranged with their small ends towards the centre, just fit the hollow, and their irregular dark markings on light stone ground-colour, break up the formality of outline, and cause them to assimilate in a remarkable degree with their surroundings. The ringed-plover forms several "false nests" or additional scrapes, and these, although unlined, are also more conspicuous than nests with eggs. I have found this habit common in the Breck district, and other observers have recorded it for the shore.[3]

It has been suggested by Dr. Kelso[4] that the ringed-plover is in a transitional stage with regard to nest-building. The transition is

[1] *Zoologist*, 1904, pp. 172-3.
[2] *Ibid.*, 1904, p. 265.
[3] *Ibid.*, 1889, p. 263, etc.
[4] *Ibid.*, 1903, p. 193.

presumably indicated by the fact that a certain proportion of the birds line their nests with vegetable material. But this habit of using material other than the small stones and shells usually found in shore nests is almost entirely dependent on the nature of the ground and surroundings. It would probably be more correct to say that the variation indicates the lines along which the evolution of nest-building has taken place, and also some of the conditions governing the development. The normal shore nest of the ringed-plover, and other shore-nesting birds such as Terns, may be presumed to approach most nearly to the primitive type. In such birds, abandonment of sand or shingle for ground more liable to dampness and cold, is generally accompanied by a marked tendency to more elaborate and substantial nest-building. There is no real evidence to indicate that the ringed-plover is more prone nowadays than formerly to nesting away from the shore, and unless such evidence can be produced, or that a change is taking place in nest-building, irrespective of habitat, it is premature to speak of the ringed-plover in this respect as in a transitional state.

These small plovers have at all times a very graceful flight. In the spring at pairing time it is particularly so. Ringed-plovers may be seen in pairs skimming low over the ground, circling to a fair height, and descending again like a flash, almost touching the ground as they do so. They do not follow each other, but each describes similar evolutions, overlapping and crossing the others line of flight. Their long, pointed wings, showing much white, give a fictitious impression of size; and as they alight on the ground after skimming a short distance with curved drooping wings, they seem suddenly to vanish from sight as they touch ground, for the white in the plumage is hidden by the closed wings; in place of the long-winged graceful flyer, is a little plump-shaped grey bird, very difficult to see as it runs with short quick steps over the sand.

The ringed-plover[1] has a very pretty way of raising its wings

[1] This action is, however, not peculiar to the one species.

straight up, and holding them so for a second or two; an action that may take place while it stands or just as it alights. Each pair of birds is nearly sure to make its nest on the ground beneath where it is seen taking the circling flights; in fact, the birds would appear to choose the spot first, and then spend the time prior to egg-laying in their aerial play.

Mr. Selous describes a formal courting action on the ground, in which the male approached the female with head and neck drawn up above the usual height. He advanced a few steps at a time, and in the pauses he moved his legs in a rapid vibratory manner, quivering with excitement as he did so.[1] This movement of the legs—a sort of rapid "marking time"—characterises the courting actions of other Waders; for instance, the redshank.

According to Naumann, where several pairs of ringed-plovers nest together the males fight "like common fowls."[2] This statement is supported by notes sent to Dr. Heatherley by Cringle, the bird-watcher at Wells in Norfolk, who says: "Pairing begins early in April, when the males can be seen fighting for the possession of the females. They fight very fiercely, rushing at each other with their beaks down and feathers bristling up. Sometimes four or five birds will be mixed up in one fight."[3] The fighting is not limited to the pairing time, for Dr. Heatherley observed that where the nests were fairly thick on the beach at Wells, and the simultaneous hatching out of a number of clutches produced a sudden increase in the number of chicks on the sand, there was constant fighting on the part of the adults to maintain "spheres of influence." "In fighting, the old birds lowered their heads and raised the feathers of their backs." There were occasional mêlées in which four birds took part. Two birds had their beaks interlocked, "and one was banging the other down on the sand."[4]

The Kentish-plover, in the nesting season, is described by the Rev. H. H. Slater as performing aerial evolutions similar to those of

[1] *Bird Watching*, p. 22.
[2] *Vögel Mitteleuropas* viii. p. 64.
[3] *Zoologist*, 1908, p. 369.
[4] *Ibid.*, 1908, p. 366.

a drumming snipe, accompanied by a sound which is undoubtedly vocal.[1] A similar description is given by Baron von Droste Hülshoff, who says: "It flies in a peculiar bat-like wavering manner, the wings fully extended, the body thrown now on the one and now on the other side, and it almost describes a circle in its flight, uttering as it flies a peculiar note, which resembles the syllables '*trit, tritritritrirrr.*'"[2]

Both sexes share in the incubation of the eggs, although it has been stated that the male alone of the Kentish-plover undertakes the task of incubation.[3] The statement, however, is refuted by pictorial evidence as well as by observation. I have photographed a female standing on the edge of her nest, and in Dr. Ticehurst's *Birds of Kent* the frontispiece is a very pretty photograph, showing a female on the nest and a male sitting by her side. Moreover, it is stated by Baron von Droste Hülshoff that the male utters an alarm-note—"*flüit*"—at which the female creeps from the nest, runs for some distance, and then flies circling round, calling "*pit-pit.*"

Of the ringed-plover Dr. Heatherley states that "they seem to relieve one another at sitting every half-hour."[4] I have obtained photographs of male and female sitting. On one occasion the male was photographed, and left the nest when the exposure was made; within a quarter of an hour the female came on to the nest, and I secured a photograph of her. The difference in plumage, especially the extent of black on the head and neck, was very pronounced in these two birds, and shows very clearly in the photographs.

When a ringed-plover is put off its eggs, it runs for some distance before taking flight. If the nest is on the seashore it is generally on a ridge a little above high-water mark, and the bird runs from the nest, with lowered head, down to the edge of the water, where it is joined by its mate, and the two run to and fro, frequently giving utterance to a low plaintive whistle. Mr. Boraston says that when an

[1] *British Birds, their Nests and Eggs*, v. p. 74.
[2] *Vögelw. Bork.*, pp. 184-7.
[3] *Zoologist*, 1896, p. 412.
[4] *Zoologist*, 1908, p. 365.

intruder approaches the nest, the female is warned by the double-noted alarm-call of the male—"*tuli-tuli.*"[1] The mate of a sitting-bird is generally near at hand, but I do not think a warning-note is really necessary, at any rate one is not always given.

From my own observations, I think that it very probably depends upon which bird is sitting. If the female is sitting, the male gives an alarm, but if the male is sitting, the female is less likely to stand on guard and sound a warning cry. It has been stated of the Kentish-plover that it "seldom makes any demonstration in the way of a call-note; it creeps away through the dry beach grass, which it resembles so closely in colour."[2] The species may certainly be described as quieter than the ringed-plover, but I have heard them uttering their alarm-notes very soon after leaving the nest; and Mr. Dombrain states that "if put off eggs, the bird retires a short distance, utters a plaintive whistle, runs a few yards, then rises on wing for a very short spell, and drops and runs again."[3]

Both species are very cautious when returning to the nest. They approach in a series of short runs and halts, and at each halt give a quaint little bob of the head. Often when one appears to be about to go on to the nest it will run straight past it, and then work back again. The ringed-plover, if there is any cause for alarm—such as a hidden camera near the nest—frequently gives sharp utterance to the alarm-note "*tuli*," or, as better expressed by Naumann, "*tül*" or "*trül.*" A ringed-plover when put off its nest will often, after running a short distance, give a sharp call, fly up and circle around its disturber, and then alight on the ground again. It will now be joined by its mate, and the two birds, always keeping a direction away from the nest, will run to and fro, sometimes venturing quite close to the intruder, and then running off very quickly in an opposite direction—frequently uttering their short sweet call—apparently endeavouring to deceive as to the locality of the nest.

[1] *Birds by Land and Sea*, p. 184.
[2] *Zoologist*, 1896, p. 412.
[3] *Ibid.*, 1880, p. 138.

When the young are hatched there is no question about the attempts of both species to lure away an intruder. Their method of procedure is similar. The adult gives a warning-note, and the young birds crouch close on the ground. The behaviour of the old birds depends now on how near the enemy approaches their crouching chicks. If not too near they content themselves by running swiftly about, often uttering a shrill whistle. Occasionally one will fly up and around, and then alighting a few yards from one's feet, run off in a direction opposite to where the chicks are crouching. If, however, one goes near the nest or handles the young birds, the anxiety of the parents becomes frantic. Flying close up, they will throw themselves breast forwards on to the ground, and with spread tail, and wings turned so as to show a great deal of white, they will shuffle along, uttering the while a pitiful squeaking cry. The female is, as a rule, more demonstrative than the male. The zeal with which the ruse is performed varies with the individual and the circumstances. I have seen a female ringed-plover shuffle along the ground—a confused bundle of white feathers—in a straight line for about fifty yards. If one remains with the chicks, the bird may stop and flutter about on the ground. If one follows her, she is more likely to fly up whistling, circle round, and alight a little distance away.

Whilst occupied in photographing some ringed-plovers, I once witnessed a very pretty episode which had the impress of concerted action. The nest contained one egg and one chick just out of the shell; another chick that had been hatched two or three hours was crouching on the ground about a foot from the nest. (Pl. xxxv., Fig. 3.) The old birds showed much concern while I was making my arrangements, running about, with much whistling, shuffling along the ground, and evidently doing all they could to lure me away. Directly I was out of sight in my hiding-tent, they flew up and settled a few yards from the nest. One gave a call, and immediately the chick that was out of the nest got up and ran towards them. They led it away rapidly, and after waiting some time expecting—in vain—that one of

them would return to the nest, I crept out to fetch back the truant. When I showed myself, the old birds flew off with a warning cry, and search as I would I could not find the chick.

I hid myself again, arranging the tent so that I could see farther afield. The ringed-plovers soon returned to the spot where their chick was hiding, and I saw it run towards its parents, who proceeded to conduct it farther away. Keeping a close eye on it, I suddenly showed myself, saw the chick drop flat, and having marked the spot, easily found it. It had moved more than a hundred yards from the nest. I took it with me into the tent and put it into a safe place. As the remaining youngster was apparently too weak to leave the nest, the old birds now approached readily enough. And now occurred what looked like concerted action, for, while the male ran to the nest and brooded the egg and chick, the female came behind the tent, and shuffled about on the ground, squeaking and flapping a wing, as though intent on attracting attention to herself, while by arrangement her mate attended to the family.

I had a similar experience with a pair of Kentish-plovers, only in this case I was fifty feet away, buried in the shingle. The camera was placed some eight feet from the nest, and I operated the shutter by means of a long pneumatic release. The nest contained two eggs and a recently hatched chick. (Pl. xxxvi., Fig. 1.) The two little plovers commenced by running round the nest in large circles, passing me at first within a few feet, then gradually closing in until but a few yards from the nest. At last the male ran on to the nest and commenced to brood, while the female behind the camera shuffled about on the shingle in an apparently helpless condition.

The Kentish-plover has also been described as flying close around the head of an intruder, giving at each stroke of the wings a sharp whistle, and then dropping as if shot, following this with the injury-feigning demonstration.[1]

It would be rash to describe the ringed-plover as more given to

[1] *Zoologist*, 1908, p. 369.

feigning injury than any other Wader. The frequency with which its performances have been observed and recorded is doubtless due to the fact that it is a common and well-known species.[1] Its demonstrations are plainly for the purpose of diverting attention from the eggs or young, and have, at least, the appearance of being the result of thought and reason. Mr. O. V. Aplin, after describing in vivid terms such a demonstration by some ringed-plovers, says: "Surely there is reasoning power and thinking intelligence here." If the birds are really feigning a broken wing, then I see no other explanation but to attribute to them reasoning power of a high order. But this would necessitate experience of broken wings and a histrionic ability on the part of the birds that it would be nothing short of absurd to attribute to them. I do not deny a consciousness of the efficacy of the act, but the "broken wing" exists only in the imagination—quite excusably—of those who have described it as such. I have witnessed various forms of the habit displayed by different species of ground-nesting birds, and a critical examination has always failed to detect anything that could really be regarded as an actual simulation of a broken wing. The birds appear very helpless, tails are spread, and wings trailed along and flapped, but *not* as when broken. I can admit a consciousness of deceiving, a pretence of helplessness, but not a knowledge of the movements of a broken wing and the art of imitating it.

I prefer to regard all demonstrations of this kind as instinctive, and as with such instincts there generally exist some imperfect cases, provided by certain species, in which the instinct is in process of development—it is to such species we should turn to learn something of its origin. What I believe to be the true explanation was first made by Mr. Edmund Selous, and was suggested to him by the behaviour of a snipe—a species in which the habit is but very slightly developed, and therefore a suitable one for investigation. Mr. Selous put a snipe off its nest suddenly; it flew up, and then dropped into the grass near the nest, "spun round over it, now here, now there, its

[1] *Zoologist*, 1908, p. 369; Patten, *Aquatic Birds*, p. 217; *Zoologist*, 1910, p. 100, etc.

long bill lying along the ground, as though it were the pivot on which it turned, and uttering loud cries all the while. Having done this for a minute or so, it lay, or rather crouched, quite still on the ground, its head and beak lying along it, its neck outstretched, its legs bent under it, with the body rising gradually, till the posterior part, with the tail, which it kept fanned out, was right in the air."[1] The bird remained thus for some minutes, and then collected itself and flew off. Mr. Selous saw in the nervous inability of this snipe to take instant flight—and, I think correctly—the origin of the habit under consideration. On two occasions I have had the opportunity of observing similar behaviour by snipe, and under conditions providing evidence—as I hope to prove presently—that in the case of a species in which the instinct may be said to be in an incipient stage, those individuals which act in the way described by Mr. Selous are of an unusually nervous temperament. I may say that I have very often seen snipe leave their nests, and that the two occasions referred to did not represent more than one per cent. I have also watched and photographed several different snipe on their nests, and have always, with the exception of the two birds mentioned above, found them come readily to the nest, and easy to photograph. But these two were so nervous that they ventured to return to their nests only at very long intervals, and then they jumped so suddenly at the sound of the shutter, that except when a very short exposure was given, the photographs were spoiled. I mention this to show that in these birds an unusually nervous disposition accompanied a tendency to display when put off their nests. If further observation could be made on other species which have not developed this habit, it seems very probable that the evidence would provide grounds for regarding the device as an evolutionary outcome of physical disability, arising from protracted periods of incubating. A bird at such a time, suddenly frightened from the nest, and for a brief period incapable of ordinary flight, might by a frenzied fluttering through the

[1] *Bird Watching*, p. 60.

Upper: Ringed-plover. Lower: Kentish-plover

By A. W. Seaby

herbage or over the ground save its eggs by diverting attention to itself.

The inability of the individual to take instant flight, and its efforts to overcome the same, have, by diverting the attention of the enemy from the nest, proved a benefit to the species, and become, by natural selection, an instinctive act having various forms. When a pratincole observes an intruder on its nesting-ground, it will prostrate itself on the ground with both wings extended and its head thrown back in a supplicating manner—even when not very near its nest. If we ascribe conscious feigning of a broken wing to the ringed-plover, we might equally well describe the pratincole as entreating the intruder to come no further. It is injudicious to judge the actions of birds by human standards, but, as Mr. Selous argues, "May we not think that an act which in its origin has been of a nervous and, as it were, pathological character, has become, in time, blended with intelligence, and that natural selection has not only picked out those birds who best performed a mechanical action—which, though it sprang merely from mental disturbance, was yet of a beneficial nature—but also those whose intelligence began, after a time, to enable them to see whereto such action tended, and thus consciously to guide and improve it?"[1]

The young are protected not only by the ruses of their parents, but by their own protective coloration. The young in down of both species are most difficult to see, whether on sand or shingle. They crouch almost as flat on the ground as does the stone-curlew, but show less dependence on the instinct than that species. They do not persist in crouching when handled, but will run off, the brood scattering in different directions. They run very quickly, holding out their little wings to help to balance themselves, but they often fall over stones or depressions in the ground, pick themselves up, and struggle on again in a very comical manner.

Flocking commences directly the young can fly. The inland-

[1] *Bird Watching*, p. 63.

breeding ringed-plovers then betake themselves to the coast, seldom being seen in their nesting-quarters after mid-August. At first they may be seen in small parties, but as the autumn advances the more northern breeding birds appear, and they gather together into much larger flocks. They mingle freely with flocks of other Waders, such as dunlin, sanderling, and turnstone, more especially when feeding; when in flight they usually keep to themselves. The Kentish-plover is said never to mix with the dunlin flocks except when numbers of ringed-plovers are also amongst them, and to exhibit none of the restlessness and timidity so marked in these other two species. "It will sit dozingly for a long period on a spot where the beach has silted up, and there wait for the tide to reveal new-born things."[1] Both ringed and Kentish-plovers are less active in the middle of the day, especially when the weather is warm. They become very active in the evening, and often at night, unless very dark, when they are seldom heard. The Kentish-plover is exceedingly rapid in its movements. Naumann describes it as the quickest runner and flier of its congeners.[2] It departs in September, by the end of which month, Dr. Ticehurst states, most have left; and he adds, "The latest observation that I have is of three birds seen on the sands at Littlestone on October 10th, 1907."[3]

Throughout the winter the ringed-plover may be seen on the shore feeding with other small Waders at low water. They are very partial to the mud-banks at the mouths of large rivers, and also find much food in the form of sand-hoppers and larvæ of flies among seaweed and other refuse at high-tide mark. They are exceedingly active and noisy when feeding, running very rapidly, and stopping abruptly to pick up some small object, repeating these little runs and halts something after the manner of a thrush.

In flight the flocks are very beautiful to watch, performing evolutions in which all move together in wonderful unity, the alternate

[1] *Zoologist*, 1896, p. 412.
[2] *Vögel Mitteleuropas*, viii. p. 64.
[3] *Birds of Kent*, p. 425.

flashes of white and grey, as they present first their upper then their under surfaces to view, being most effective. When a flock is scared from its feeding-ground at the edge of the tide, the birds generally fly out to sea in a body, for a short distance, and return often close to the spot where disturbed.[1] In alighting they often swing round in part of a circle, skim lightly over the sand with outstretched wings, and the next instant are running rapidly about in search of food. The flocks are said to frequent one place all the winter if not shot at.[2]

The notes of these plovers may be described as for the most part short, melodious, flute-like, whistling cries. They have been variously expressed by different authors, but the German of Naumann conveys the best idea of the sound. The English "*u*" in "*tuli*"—the usual rendering of the alarm-note of the ringed-plover, is misleading; "*tooli*" expresses it more nearly, but Naumann's "*tül*" or "*trüll*" is far better. The same author gives us other variants of the whistle at ordinary times—"*trüi*" *or* "*trü.*" The pairing note of the male he describes as this note repeated quickly, with an "*l*" occurring occasionally; "*trüi-trüi, trüil-trüil,*" the time long at first, and then gradually quickening: he likens it, aptly enough, to the "jodel." Naumann believes that the female utters this note as well as the male. It is heard most in morning and evening.[3] Besides "*tuli,*" other English renderings are "*chū-ĕ-chū-ĕ,*[4] and "*pen-y-et*" as the alarm-note when the birds have young.[5]

The notes of the Kentish-plover are less shrill than those of the ringed-plover, and generally consist of one syllable, a flute-like "*piu*" or "*püi,*" which, as Naumann states, is not repeated quickly, but at fairly long intervals. It also adds a soft "*pit-pit.*" The alarm-note is "*tior-tior.*" The pairing-song is expressed by Naumann as "*pütt-pütt pit-pit-pit,*" followed by a quick trill.[6] This is quite distinct from any note of the ringed-plover. Baron von Droste Hülshoff expresses the

[1] Patten, *Aquatic Birds*, p. 217.
[2] *Zoologist*, 1908, p. 369.
[3] *Vögel Mitteleuropas*, viii. p. 64.
[4] Patten, *Aquatic Birds*, p. 217.
[5] Stevenson, *Birds of Norfolk*, vol. ii. p. 92.
[6] *Vögel Mitteleuropas*, viii. p. 56.

pairing-song "*trit tritritritrirrr.*"[1] The beauty of the system of expressing bird-notes in words is that, if you are familiar with the note, almost any formula will serve to recall it. If you are not familiar with the note, no formula will convey an idea of the real thing.

The Kentish-plover has been described—by one who knew it well—as a *noisy* little bird. "They course over the beach all day long uttering their whistling cries. Even the skylarks have caught their plaintive notes, and they produce them amongst their own with startling exactitude."[2]

3. THE GOLDEN- AND THE GREY-PLOVERS

[W. Farren]

These two handsome plovers have much in common. Their plumage is similarly ornamented with dark mottlings—one on a gold, the other on a silver ground. In the breeding season both don a deep black throat and breast; in general habit they are very similar, but the apparently insignificant difference of a diminutive hind-toe which is present in the grey, but not in the golden-plover, is considered sufficient reason for placing the two in different genera.

In spite of the superior size and the bolder barrings on the back of the grey-plover, and the silvery whiteness of the lighter parts of its upper surface, compared with the yellow of the golden-plover, there is a time when some difficulty may be experienced in distinguishing between them in the field. This is in the autumn, when the young birds of the two species have not acquired that amount of colour contrast that distinguishes them in after life. The yellow on the back of the golden-plover at this stage is less clear, and the white of the grey-plover is tinged with yellow. A small hind-toe, sufficient to form

[1] *Vogelw. Bork.*, pp. 154-7.

[2] *Zoologist*, 1896, p. 412.

a generic character, is no help in identification in the field, but the difference in colour of the axillary plumes, which are black in the grey and white in the golden-plover, forms a useful guide as to their identity when flying.

The golden is the more familiar bird. It breeds on many wild moorlands in the western half and in the north of England, also in Wales and Ireland, and throughout Scotland and its islands. In winter it may be seen in large flocks on the seashore, the marshes, moorlands, and cultivated fields. The grey-plover is but a bird of passage in spring and autumn, and a fairly numerous winter visitor, frequenting the sea-coast and adjoining marshes. Its nesting-quarters lie in the far north. So far as is known, it does not breed west of the island of Kolguev and the Petchora river. Here it nests in fair numbers, and also by the Yenisei and on the tundras of arctic Asia, especially on the Taimyr Peninsula. Its range is continued across the barren lands north of the Arctic Circle, in America, to Greenland, where, however, it appears to be rare. In winter it does not wander so far south in the New World as in the Old; it has hardly been recorded below Brazil. In the Old World it ranges from Africa to Australia. On migration it passes down Scandinavia and Great Britain, and along various routes in the large river valleys of Central Europe and Asia.

Like all birds that nest in the far north, it is in no hurry to make the spring passage, timing itself to arrive at its nesting grounds with the breaking up of the long Arctic winter. The birds which have passed the winter with us begin to work north towards the end of April, but it is doubtful if any leave the country until the great northward-bound flocks from southern wintering-places pass along our coasts late in May, when the birds have already acquired their black breasts, and their golden cousins have already hatched out many a brood of downy chicks. I have seen immense flocks of grey-plover resting and feeding on the steaming marismas of Southern Spain in the third week of May. A few days before they were, may be, south

of the equator on the African coasts, and a few hence and they will be north of the Arctic Circle. There the nesting season is short and sharp, and before August is far advanced their young families will be taking that first journey southwards, unguided—if the migration investigations have fully penetrated their mysteries—by any birds that have made the journey before.

The golden-plover breeds commonly in the Færoes and also in Iceland, throughout Scandinavia, North Russia, and North Germany. It may breed in East Greenland, as a bird in breeding plumage was shot there in 1871.[1] In the Arctic, its breeding range appears to lie to the west of that of the grey-plover. The two species overlap a little, as Harvie-Brown and Seebohm found the golden-plover nesting on the tundras by the Petchora,[2] and Seebohm found it near the mouth of the Yenisei, but here the eastern golden-plover (*Charadrius dominicus fulvus*) is far more numerous, and takes the place of our bird in Asia and Alaska. In its turn this is replaced in America by a closely allied race (*C. dominicus dominicus*). Odd specimens of these two races of the smaller species have found their way to Great Britain. In winter the golden-plover visits Central and Southern Europe and France, and also the northern part of Africa.

As early as February golden-plovers begin to take to the moors, going direct to their old nesting-places—which may be on heather-covered moorlands, grassy hillsides, or in marshy places but little above sea-level—and early in March most of our resident birds have settled down in pairs. As there is a general southward movement in winter, it follows that the breeding birds almost invariably approach their nesting-places from the south, some from overseas, but many from our own southern counties. As late as May there are still flocks of golden-plovers, especially in the northern half of our islands. These are birds that nest in the far north, and whose nesting season is therefore much later. Many a pair of British birds have eggs, and even

[1] Yarrell, *British Birds*, iii. 276.

[2] *Ibis*, 1876, p. 222.

young, before the last of these lingering flocks are away to their northern nesting-quarters.

Of the courting habits of these species but little has been recorded. As with many other shy birds which nest far from the haunts of man, such habits are difficult of observation, and, as a rule, visits to their nesting-places are not made until the season is too far advanced to learn much of their ways during the interesting period preceding egg-laying. The males of both species indulge in what appears to be a nuptial flight and love-song. The golden-plover floats around in circles high up above the nesting-place, occasionally describing a graceful vol-plane to the ground, frequently uttering a warbling song. This song has been described by Mr. Abel Chapman as "a peculiar rippling song or warble, a joyous note of courtship."[1] Naumann renders it "*taludl-taludl-taludl-taludl*," and states that it is sometimes uttered on the ground, but not often.[2] The song of the grey-plover is less ambitious, and it may be wrong to call it a nuptial song at all. It is certainly associated with the nesting time, and is peculiar to the male. It is described by Harvie-Brown and Seebohm as a treble whistle. The males associate in small parties of three or four whilst the females are sitting; they rise to a great height and dash about in erratic curves, or dive down impetuously, and rapidly rise again; "they then remain almost stationary like a Temminck's stint, raising their wings over the back until they nearly meet, and finally flying with long tern-like sweeps of their wings, utter their musical treble note."[3] The whole proceeding is probably analogous to the piping parties of the oystercatcher and somewhat similar displays in other species, in which several birds associate together, and perform actions similar to those peculiar to courtship, at a time when courtship should be a thing of the past.

The golden-plover is shy of its own kind, the nests generally being

[1] *Bird-life of the Borders*, p. 28.
[2] *Vögel Mitteleuropas*, viii. p. 26.
[3] *Ibis*, 1876, p. 222.

a good distance apart, although often not far from those of the curlew or lapwing. The nest is a scraped hollow, either in a tussock of grass, among heather, or on a bare place. It is lined with a few pieces of dead grass, moss, or any convenient material. The amount of lining depends on the situation; in some nests there is so much as to constitute a well-constructed nest. Like other Waders that breed also on the fells and tundras of the north, it makes use in those localities of the reindeer-lichen.

The nest of the grey-plover is described as a deeper cup than that of the golden; the lining sometimes consists of a few broken twigs and leaves from the surrounding plants, or more usually broken grass and reindeer-lichen, but in such small quantities that it can hardly be regarded as extraneous lining, but simply that which was on the spot when the hollow was formed. Harvie-Brown and Seebohm found the grey-plover nesting on the higher and drier ridges in very boggy ground, while the golden-plover preferred the higher tundras.[1] In general nesting-habits the two species are very similar, the golden being, as a rule, shyer at the nest, but even this depends on circumstances.

On the average the eggs of the grey-plover are decidedly larger than those of the lapwing and slightly bigger than those of the golden-plover, but in shape and character they resemble them, though as a rule the ground-colour tends to rather a colder shade than is usual with the golden-plover, the rather small spots and blotches of deep black being placed upon a stone-coloured or olivaceous buff ground. Average size of 12 eggs, 2·04 × 1·45 in. [52 × 37 mm.].[2]

While it is quite certain that the male assists in incubation, it is not by any means easy to say to what extent. Dr. Heatherley, who watched at a golden-plover's nest in Wales, on and off for several hours a day, from May 12th to June 3rd, never once saw the male; he presumed that the bird he did see was the female. She came readily to the nest whilst he was concealed in a hiding-tent a few

[1] *Ibis*, 1876, p. 222.

[2] F. C. R. Jourdain (*in litt.*)

Golden-plovers

By A. W. Seaby

yards distant, uttering occasionally the single note "*tu*" or "*tui*," both on her way to the nest and whilst sitting. He heard afterwards from a keeper that when the young were hatched out, on June 4th, the male appeared, and assisted the female in looking after the brood. The male was easy to distinguish, having much more black on the breast and throat.

On the other hand, four birds shot from the nest by the Rev. H. H. Slater all proved on dissection to be males.[1] Seebohm also records shooting a male from eggs,[2] and in the fourth edition of Yarrell it is stated that "Mr. R. Collett shot one—a male—from four eggs on 14th June 1872 in the valley of the Maalselv, in Norway, the female not being observed."[3] Of the grey-plover one bird shot from the nest in Kolguev was a male,[4] but Mr. Trevor-Battye never found the male brooding.[5] Harvie-Brown and Seebohm shot several females from the nest, but at the first nest they found the bird—shot as it was apparently coming to the nest—was a male.[6]

The relative behaviour of males and females of both species alter as the season advances. When the eggs are first laid, the male stands, silent for the most part—on an eminence at some distance from the nest, while the female is anxious and restless, running backwards and forwards near the nest uttering an alarm-note. As incubation progresses the anxiety of the male increases. He warns his sitting mate of the slightest danger, and flies up noisily calling, whilst the female profits by the diversion thus caused to slip from the nest and run stealthily away. She then flies up and joins the male, and the two fly round the head of the intruder, with constant repetition of their plaintive notes. Occasionally they will alight on the ground, run rapidly to and fro, stopping at intervals and standing very upright, and gaze anxiously at the disturber of their peace. They have a funny way of running sideways, even backwards, in order to keep an

[1] Slater, *British Birds, their Nests and Eggs*, v. p. 77.
[2] Seebohm, *British Birds*, iii. p. 38.
[3] Yarrell, *British Birds*, iii. p. 273.
[4] Slater, *op. cit.*, v. p. 82.
[5] *Icebound on Kolguev*, p. 432.
[6] *Ibis*, 1876, p. 222.

eye on the source of danger. Like lapwings, they will follow an intruder a long way from the nest—seeing him safely off the ground, as it were—and then wheeling round fly back to their home.

When the young are hatched the parents are even more solicitous and noisy, occasionally, when pressed, resorting to the so-called injury-feigning device.

When disturbed whilst sitting, the golden-plover generally runs from the nest, warned—as just stated—by an alarm-note from its mate, who stands on guard on a slight eminence some distance off. But they do not always behave in the same way. One may rise straight from the eggs while the intruder is two hundred yards away, another creeps off and runs stealthily through the heather, while—but more rarely—a bird may remain on the nest, and allow itself to be all but trodden on before it goes.[1] It very likely depends on the sex of the sitting bird. If it is the female, the male is pretty sure to be on guard and give an alarm, so that the female has time to leave the nest stealthily. When the male is sitting the female is less likely to play sentry, and it is fairly well proved that the sitting males of other species—for instance, the lapwing—nearly always fly straight from the nest. It is a point that would repay careful observation, but it is fraught with much difficulty, as there is very little sexual difference in plumage throughout the group.

Mr. Trevor-Battye states of the grey-plover that the male is exceedingly wild and wary. He sits on a raised point a little distance from the nest, and warns the female of danger by an alarm-note, when she runs from the nest and joins him. Mr. Trevor-Battye saw females "feign lameness," but not males.[2] He does not mention the curious flight of the males—recorded on page 383—as observed by Harvie-Brown and Seebohm, who also stated that males as well as females display in the "injury feigning" habit. In one instance a

[1] Seton-Gordon, *Birds of Loch and Mountain*, p 68; and Chapman, *Bird-life of the Borders*, p. 30.

[2] *Icebound on Kolguev*, p. 432.

male near a nest suddenly ran across a flat grass-covered bog with head down and bill open; he then lay down on his breast and stretched out his wings to their full extent along the ground, remaining so for about half a minute.[1]

Seebohm describes a curious flight of the grey-plover; when it leaves the nest it tosses its wings in the air with an action like that of a tumbler-pigeon.[2] A similar action was observed by Lord Lilford, who further stated that they actually throw somersaults. This was noticed particularly in March 1857 in the Gulf of Arta. It is therefore not confined to the nesting season.[3]

Mr. Trevor-Battye says that the grey-plovers attack the Arctic-skuas with much boldness; they "actually seem to hit the skuas, wheeling round them, and then making a point high above, they would drop down like a stone, literally knocking the skuas out of time."[4]

The incubation period of the golden-plover, ascertained by W. Evans, by eggs hatched in an incubator, as 27 days,[5] would no doubt apply also to naturally hatched eggs. The nest watched by Dr. Heatherley (*ante*, p. 384) was found on May 10th with four eggs. These hatched out on June 4th, 24 days after discovery, at which time it was thought that the bird had been sitting several days.

The young birds are said to leave the nest as soon as they are hatched, but this statement—made so generally with regard to all Waders—needs modification. The young of some species—*e.g.* ringed-plovers—certainly seem to leave the nest directly their down is dry, but many species remain in the nest, unless disturbed, for periods varying from three or four hours to two or three days. Dr. Heatherley has known golden-plovers to remain as long as sixty hours.[6] During this time they require no food, as when hatched a considerable quantity of the yolk-sac is unabsorbed. This refers to all Waders according to my observation.

The young birds grow quickly, and can fly in four or five weeks

[1] *Ibis*, 1876, p. 222.
[2] Seebohm, *British Birds*, iii. p. 52.
[3] Dresser, *Birds of Europe*, vii. p. 461.
[4] *Icebound on Kolguev*, p. 432.
[5] *Ibis*, 1891, pp. 52-93.
[6] *Country Life*, August 26, 1905.

after they are born. By the end of July the golden-plovers commence to flock and move southwards from the moors, resorting to the mud-flats, salt-marshes, and seashores. Their ranks are added to continuously as the birds come down from the Highland moors. In September the great flights from abroad take place.

The order of the autumn migration is the same in both species. The first to arrive are a few old birds still in breeding plumage; these may appear in August, or as early as the end of July. The young birds follow in the end of August and September, and in October the rest of the adults, clean-moulted and in full winter plumage, appear. Mr. Abel Chapman states of the grey-plover that in Northumberland the main immigration occurs in mid-September, and consists entirely of young birds. He thinks the adults must take a different route, as "the few which are obtained come in August, a month before the young.[1] The bulk of the grey-plovers which migrate by way of our Islands appear to continue their southward passage without a very prolonged stay. There is considerable fluctuation while migration lasts, but by November their numbers are reduced to the regular winter population. They are more numerous on the east than the west, and are rarer in Ireland than in England. In Ireland the grey-plover is seen more often in the north and north-west.[2] It keeps more to the coasts than the golden, and is never seen in large flocks. "Stands" of thirty or forty birds may occasionally be seen, but more often of eight to twelve. Mr. Abel Chapman describes them as sociable rather than gregarious. They associate with the flocks of other Waders—two or three may often be seen with the large flocks of dunlins, and Professor Patten has seen small parties with turnstones, looking for food, after dusk, on the sand.[3]

The autumn migration of the golden-plover is rather erratic: vast flocks were seen in August 1880 and September 1881 passing over Spurn in a northerly direction.[4] Later in the year, flocks move

[1] *Bird-life of the Borders*, p. 245.
[2] Payne-Gallwey, *The Fowler in Ireland*, p. 175.
[3] *Aquatic Birds*, p. 233.
[4] Yarrell, *British Birds*, iii. p. 274.

north or south according to weather conditions, but the above mentioned movements had every indication of being migratory, and unless the birds had for some reason altered their course, their northward direction is difficult to explain. In the autumn and early winter large flocks are occasionally heard at night passing over towns. Stevenson gives the dates of noticeable flights over Norwich as August 14th and 20th, October 13th and 21st, and November 29th.[1] I have heard them, but not so frequently as other Waders, passing over Cambridge, generally in August, the cries lasting from one to three or four hours. This however cannot, I think, be regarded as indicative of the size of the flocks, as the birds no doubt circle about for some time over the lights. For the same reason it is difficult to discover the direction of flight. As a rule they appear to be travelling south-west.

They migrate by day as well as by night; a flock, described as consisting of thousands, was seen in the evening of September 18th, 1901, at a great height over Dublin Bay; they circled many times, and then flew vertically down to the slob-lands, where they all immediately huddled together, sunk their heads on their shoulders, and assumed a tired attitude. They were watched for an hour, during which time they did not move or feed. The next day all were gone.[2]

In Ireland the golden-plover is most numerous in the first half of the winter; it is then far more abundant there than in England or Scotland. Immense flocks arrive in October, and for a week or two remain on the coast. They then disperse inland, and are especially numerous on the boggy land and pastures bordering fresh-water lakes, and only return to the shore in frosty weather. If severe frost sets in they vanish southwards, but in open weather they remain until the middle of December, after which time only small scattered flocks are seen.[3]

During the winter, if the weather is mild and open, the golden-

[1] *Birds of Norfolk*, ii. p. 75.
[2] Patten, *Aquatic Birds*, p. 226.
[3] *Aquatic Birds*, p. 226; and also Payne-Gallwey, *The Fowler in Ireland*, p. 182.

plover is more often found inland than on the coast, but the flocks are ever ready to shift on the approach of stormy weather, and a frost —sufficient to bind the ground—will drive them to the shore, where they feed at low water on the sands. Professor Patten has repeatedly seen flocks detach themselves into small parties as the tide rises and covers their feeding-grounds, and again congregate as the sands are laid bare.[1]

Inland they frequent cultivated land and pastures, and are often especially numerous on the rich grass-lands in the "washes" of the fens. They may be seen feeding in company with lapwings, and, like this species—take a siesta in the middle of the day. If approached when feeding or resting in a field, they at once exhibit a wary restlessness, stretching their wings above their backs, running towards each other, stopping to look anxiously around, running again, until all are gathered into one fairly dense pack. Whether they rise simultaneously, or, as is more often the case, in straggling sections, they soon mass and wheel off with military precision. Their wings seem almost to touch, but they move with such uniformity that, however abruptly the direction of flight may be changed in the amazing evolutions they perform, there is not the slightest break or sign of disorder. Rising to a great height, the ranks spread out, forming a large oval cloud of birds, close in again to a dense dark mass, or stream out into undulating or V-shaped line, but all in most perfect order. When about to alight they sweep to and fro in rhythmical curves, gradually nearing the ground, and often, as if half changing their minds as to where they wish to alight, swing round the field, and then come to ground with almost surprising suddenness. If intent on feeding, they commence running at once, spreading over the ground in open order, busily working along with alternating runs and halts, in true plover fashion. But even plovers cannot always be feeding, and sometimes they may be seen to remain standing where they pitch, all looking in one direction for such time as to weary the patience of a watcher, who sees

[1] *Aquatic Birds*, p. 226.

nothing more exciting than a bird here and there lower its head and slowly lift its wings over its back in a luxurious stretch.

Mr. Chapman says that the golden-plover occasionally utters its spring love-song in autumn. And in describing the remarkable evolutions of a flock of some two hundred birds which were seen on October 31, 1882, chasing each other and repeatedly uttering their spring notes, says: "Now high up in the clouds, then suddenly darting down in a hundred curving lines, like falling stars, right to the very heather, whence they rise again, reuniting into close order in the sky, when the pack would again shiver into atoms, dashing headlong downwards in every direction."[1]

Both species pick the bulk of their food from the surface of the ground, insects in various stages, small land-shells, worms, and slugs —nothing in the invertebrate line comes amiss. The golden-plover likes to vary its diet with occasional berries and the seeds of field-plants, and no doubt the grey does likewise. Both, when in Arctic breeding-places, probably find a rich food-supply in the vast hordes of mosquitoes and their aquatic larvæ. In winter both species turn their attention to the various denizens of the seashore—molluscs, crustaceans, and sand-worms; while the grey has been seen seeking food in the foam on the edge of the water,[2] and, wading in, swim after small fish and shrimps.[3] The grey-plover, if all else failed, would hardly wax fat on the "marine insects" that several authors of note—Audubon, Dresser, Howard Saunders, and Patten—credit it with eating. Not this species only, but many Waders, are said—in the standard works—to subsist partly on "marine insects," although entomologists so far have failed to discover them. It is difficult to guess what is intended, probably some small indeterminable forms of marine life found in the birds' stomachs. If so, it is unscientific and misleading to ascribe them to something definite, especially something that does not exist. If the insects that breed in decayed seaweed and

[1] *Bird-life of the Borders*, p. 103.
[2] Baron Droste Hülshoff, quoted by Dresser, *Birds of Europe*, vii. p. 461.
[3] Patten, *Aquatic Birds*, p. 233.

other refuse accumulated at high-water mark are intended, then it is wrong to call them marine,—as much so as to call a sparrow marine that has built its nest on a pier-roof.

The usual call-note of the golden-plover is a musical double whistle. It is suitably rendered by Naumann "*tlüi*," or sometimes trisyllabic "*tlüei*." Other renderings are "*clēī-wĕĕ, clēī-wĕĕ*"[1] and *kl-ēē*.[2] The alarm-note is shorter; Dr. Heatherley renders it "*tu*" (as in French), also "*tiu*" and "*tui*."[3] Naumann gives "*tli*" and Seebohm a plaintive "*kö*."[4] The same author describes the spring song of the male as the call-note uttered so quickly as to become a trill. It is syllabled by Naumann as "*taludl-taludl-taludl-taludl*." Mr. Abel Chapman describes another note uttered in early spring as "*tirr-pēē-yŏu*," and states that it almost ceases when the eggs are laid.[5]

Messrs. Harvie-Brown and Seebohm, in their original account of the nesting habits of the grey-plover, could not agree as to how to render the various notes, and so wisely limited themselves to a description. The notes were described as three in number. The call-note a double whistle, the first part short and the second drawn out; the alarm-note a single plaintive whistle, about half a note higher than that of the golden-plover; and the breeding-note of the male a treble whistle — a combination of the call and alarm-notes — the second syllable having a lower intonation than the first and third. This last is not so commonly used, and appears to be the call-note of the males to one another when flying apart from the females, and generally when flying high.[6] Free from the restraining influence of Harvie-Brown, Seebohm afterwards put these notes into words in his *History of British Birds*, as follows: "*Kl-ee*" or "*kleep*," "*köp*" (the "*ö*" in German), and "*kl-ee-köp*," respectively.[7] The call-note has also been rendered "*tlēē-ĭh*" or "*chēē-ĕĕ*,"[8] and by Baron Droste Hülshoff as "*tlj-e-ih*," which he says cannot be mistaken for the "*tlüi*" of the golden-plover.

[1] Patten, *Aquatic Birds*, p. 227.
[2] Seebohm, *British Birds*, iii. p. 37.
[3] *Country Life*, August 26, 1905, p. 284.
[4] Seebohm, *British Birds*, iii. p. 37.
[5] *Bird-life of the Borders*, p. 28.
[6] *Ibis*, 1876, p. 222.
[7] Seebohm, *British Birds*, iii. p. 52.
[8] Patten, *Aquatic Birds*, p. 233.

PLATE XI

Right: Grey-plover, adult and immature. Left: Whimbrel

By A. W. Seaby

They repeat this with long pauses, especially at sunset, when they are very uneasy, and fly about calling continually late into the night. Occasionally they repeat the call so quickly that it becomes a "Jodel" call. When a couple quarrelled they called loudly "*tlju, tlju.*" [1]

In both of these plovers there is a good deal of individual variation in the intensity and distribution of the black acquired on the throat and breast in the breeding season. In two birds of equal age and vigour the males would probably show the richer development of black, but it cannot be taken as a guide as to sex in all pairs. The golden-plovers that nest in the British Isles do not assume so perfect a spring dress as those that nest in more northern climes. In all of the photographs taken by Dr. Heatherley (*ante*, p. 384) the bird appears to be the same individual. The black area is broken and mottled with light feathers, and is limited to the throat and breast; there is none on the sides of the head, and very little on the lower part of the neck. The mate of this bird, which appeared after the young were hatched, was said to be richer in black.[2] Mr. Abel Chapman says the Northumbrian birds always have more or less white mixed in with the black, giving them a marbled appearance.[3] There is also often a distinct break between the black of the throat and breast. The rule seems to be, the farther north the richer the development of black. Even in the Shetlands and in Norway there is a decided difference. Of the grey-plover Harvie-Brown and Seebohm state that the males appear to have richer contrast—darker breasts and cleaner white over the eye—than the females; but some females are much darker than others, nearly as dark as some males. They also thought that males retained the black longer than the females.[4] Mr. Trevor-Battye described the breasts of all males as being equally dark, whilst the females varied.[5]

[1] Dresser, *Birds of Europe*, vii. p. 461.
[2] *Country Life*, August 26, 1905.
[3] *Bird-life of the Borders*, p. 17.
[4] *Ibis*, 1876, p. 222.
[5] *Icebound on Kolguev*, p. 432.

4. THE LAPWING

[W. Farren]

The lapwing is the most familiar of all the Waders. It loves desolate places far from human habitation, but meadows just beyond the house-line of a large town suit it equally well. It nests on highland moors and lowland fields, boggy marshland, and dry sandy fallows, plough fields, meadows, and commons. The only invariable condition is that the situation must be perfectly open, for the lapwing at all times is a wary bird, and avoids localities whence it cannot sight danger from afar.

The species is found from February to June in favoured localities from one end of the British Isles to the other, and, outside our boundaries, from the Arctic Circle to the south of Spain and Northern Africa, and eastward to Japan. It is resident throughout temperate Europe, moving southwards in winter from the more northern nesting-grounds.

Of late years its numbers in the nesting season have somewhat increased in the north of Scotland, but fewer breed than formerly in many southern localities. This is especially true of East Anglia, where the draining of the fens so altered the character of the country as to lose entirely for us, as nesting species, many interesting marsh-birds. But the lapwing, less specialised in habitat, may still be seen, although in diminished numbers, sporting over the black land of the rich cultivated fields that were once a dreary waste of marshland.

Large numbers of the birds are shot or netted for the market in winter, which, however, has but little effect on the vast flocks that visit us at this time. A far more serious levy on the resident breeding stock is the indiscriminate taking of their eggs, which still goes on unrestricted in most districts. Large numbers of the "plovers' eggs"

sold in London are imported from the Continent, but the high prices obtainable, especially in the early part of the season, makes "egging" too profitable for the entertainment of any hope that it may be entirely abandoned for some time to come in this country. In some counties the bye-law prohibiting the taking of birds' eggs is extended to the lapwing, but although well intentioned, this bye-law is but a dead letter in the absence of special and rigorous steps for carrying it out.

It is in every way deplorable that the lapwing should so suffer persecution, for, apart from other considerations, it is one of the most valuable of birds to the agriculturist. Its food consists almost entirely of insects, slugs, and other creatures injurious to crops, and, as is certainly not the case with all birds which do good in this way, there is no debit side to the account.

The plumage of the lapwing does not undergo a great seasonal change. In February black feathers begin to appear in the white of chin and throat, and in March those parts become entirely black in the majority of individuals. A good many however—even of breeding birds—show a varying amount of white feathers among the black, and some show but a slight speckling of black. While in some pairs of birds I have watched there has been a more perfect development of the black throat in the male than in the female, yet I do not think it depends so much on sex as on age. Young lapwings do not attain the full beauty of the adult plumage until their third year, and I think if birds with imperfect black throats in the breeding season could be closely examined they would be found to be young birds. These can be distinguished from fully adult birds by the narrow buff edges to the feathers of the back, which are not lost until after the second winter, and also by the shorter crest. The fully adult lapwing is an exceedingly handsome bird. The solid bronzy green of its back, which is iridescent, shows blue and purple in certain lights. The intense black of the broad band on its breast, contrasted with the pure white coming next to it below, makes the slight embellishment

in the spring of a continuance of the black from the breast band up to the chin seem trivial and somewhat meaningless. From an æsthetic point of view it is a distinct enough gain, as it effects a massing of the lights and darks of the plumage. There is, in addition, an apparently added brilliancy to the whole plumage, especially of the back; and the long curved crest attains its full development at this time.

Lapwings return to their breeding-grounds in February or March, the date being more or less dependent on locality and weather conditions. The social state is abandoned very gradually at first; half-hearted quarrels between individuals which may be, probably are, males occur, but these are neither severe nor lasting enough to disturb seriously the harmony that generally prevails. In the opinion of Mr. S. E. Brock, who contributed an interesting and valuable article to the *Zoologist* (1911, p. 296) on "Lapwings in the Pairing Season," there is naturally a preponderance of males, which is especially noticeable in the early days of their reaching the nesting-grounds. The difference between the sexes is so slight, that, in the field, it is easier to distinguish them by actions that one is able with fair certainty to ascribe to one or the other sex. Even so I have found it a difficult matter to decide in certain cases. Mr. Brock appears to have completely overcome this difficulty, as he never once expresses a doubt in attributing certain actions to male or female. The males are said to spread over the nesting area, each taking up its position on, and jealously maintaining against trespassers, a more or less well-defined territory. Mr. Brock says, "Here they spend a large part of the day, occupying themselves in the formation of scrapes, in aerial combats with other males, or in courting any female bird which may happen to settle not too far off, while at intervals they indulge in prolonged song-flights, ranging over a wider area."[1]

The habit of forming additional nests or scrapes, common among ground-nesting birds, especially Waders, is more prevalent with the lapwing than any other, or perhaps it would be more correct to say

[1] *Zoologist*, 1911, p. 297.

it is better known. For a long time it has been known or suspected that these scrapes are formed by the males—they are commonly alluded to by gamekeepers and egg-gatherers as "cocks'-nests." The investigations of Mr. Edmund Selous went far towards confirming this, and explaining the origin and significance of the habit, but it has remained for Mr. Brock to discover more definitely the part the scrapes play during the early spring activities. Extra nests constructed by some species, such as the wren and moorhen, have received a certain amount of attention, and these also have been called "cocks'-nests," but little is definitely known about them. The extra scrapes formed by tree-pipits and wood-larks have been passed aside as dust-baths, but they are as distinct from such, and as obviously "scrapes," *i.e.* places prepared for nests, as are the false nests of the lapwing. In all probability there is some analogy between all, or at any rate all owe their origin to the same cause, which I would suggest is excessive reproductive energy on the part of the males. It has been stated that the scrapes of the lapwing are formed while the male is showing off to the female.[1] This is true so far as it goes, as the male certainly displays in a scrape when a female is near, and when he is therefore under the influence of extreme sexual excitement. But it entirely disregards the very important fact that the male may be seen scraping—and considerably more often—when there is no female present.[2]

During the days that elapse between the return to the nesting-grounds and mating, each male will form a number of scrapes, spread over his particular territory, and generally in groups of two or three. In these scrapes he frequently works. Sometimes he abandons a group formed in the early days, and forms another set at some distance off, thus effecting a modification in the limits of his territory, which, as Mr. Brock observes, are always vaguely defined. Although later, when mated, the female works in some of the scrapes formed

[1] Howard Saunders, *Manual of British Birds* (1899), p. 556.
[2] See also *Zoologist*, 1911, p. 300; and *Bird-life Glimpses*, p. 164.

by the male, and goes so far as to add a little lining to one or two, yet she does not appear to start fresh ones. Thus, as Mr. Brock says, "The exact situation of the nest is primarily dependent on the choice of the male bird—a condition of affairs somewhat unexpected." [1]

The action of scraping varies but little except in the energy displayed. This is of a more vigorous nature when the bird is excited by the proximity of a female, and more especially so when he has secured one for a mate. But a male may continue working energetically for some days before there is any sign that his domain is visited by a particular female. He may be seen standing alone, raising and lowering his wings and tail, and occasionally uttering a long rasping note. This is usually the prelude to scraping, but either action may take place independent of the other.[2] The swaying of wings and tail may continue, but as a rule it soon ends by the bird pitching suddenly forward on his breast, with the posterior part of the body elevated at such an angle that the tail and the tips of the wings point almost straight upwards. In this attitude he rotates on his own axis and maintains a rolling or shuffling motion with his breast, and scrapes energetically with his feet. At intervals the wings are lowered, and the tail bent down spasmodically until the ends of the feathers are pressed close on to the ground. He may continue working in this way for some time, the raising and lowering of the wings and tail occurring at more or less frequent intervals. All periods of rolling or scraping are accompanied by an apparently aimless pecking at the surrounding herbage; tufts of grass are plucked up and shaken from side to side, and even tossed by the bird over its back. This will continue after the bird has risen from the scrape, and now, as he has probably advanced a step or two, some of the grass tufts which he throws over his back may fall into the scrape, but this appears to be the result of accident rather than design.[3]

[1] *Zoologist*, 1911, p. 300.
[2] See also *Zoologist*, 1911, p. 299.
[3] See also *Bird-life Glimpses*, p. 163; and *Zoologist*, 1911, p. 299.

The number of scrapes to be found in the vicinity of each nest varies considerably. Sometimes it is difficult to find more than three or four spread over a fairly large area, and I have counted as many as thirty, arranged in groups of four or five. These were on a long narrow ridge of peaty soil, with deep bog on either side, and appeared to be the work of one bird, as although two or three of the scrapes were slightly lined, one only contained a single egg. The number of partly lined scrapes does not, as a rule, exceed two or three in number; in these the lining shows sign of having been worked into place, as distinct from those containing odd tufts of grass which may have fallen in during the haphazard tossing about of material by the male. If the ground about a group of scrapes is examined, it may often be found strewn with tufts of dead grass pulled up as described. With the exception of the more elaborate lining, the real nest does not differ from the scrapes near it, nor does it appear to be in a more eligible site. In form the scrapes do not vary to any great extent, although they differ somewhat in appearance according to the nature of the ground. In cultivated fields, where the soil is loose, the interior of the scrape shows sign of much pressing and patting down, and on grass-land the growing grass is scratched away leaving the bare earth. The only locality where I have seen a decided departure from the clean saucer-shaped hollow is in the Suffolk Brecklands. Here, in parts where rabbits abound, the ground is covered with close-cropped grass and lichen, which forms a tough crust on the sandy soil. This crust often breaks away in lumps under the working of the lapwing, giving an irregular shape to the scrapes. Such irregular scrapes are not uncommon, including that in which the eggs are laid. (Pl. xxxvi., Figs. 3 and 4.)

The progress of courtship is marked by two distinct actions on the part of the male. The first of these is adopted whenever a female comes within reach of an impressionable male. With lowered head and neck stretched out and held rigidly in a straight line with the body, and the crest carried flat along the neck, he advances towards

the female with formal steps. He may circle partly round her and then commence working in one of his scrapes, or he may walk straight past her direct to the nearest scrape.[1] Mr. Brock states that the females show no response to the advances of the males for about a fortnight after courtship commences, and at times indicate "annoyance and distaste by a rapid retreat, even passing to a distant part of the field."[2] The first sign that the female gives of acceptance of the attentions of a male is by approaching him "by short and indirect stages" while he is scraping, as though interested in the proceeding.[3] The male rises from the scrape and adopts a pose which savours more of display than the set run with extended neck, which is rather a prelude to scraping. In this pose, as described by Mr. Brock, the male, "keeping his back turned towards the hen, now very close beside him, slowly lowers his bill to the ground and raises his tail almost perpendicularly in the air, his richly coloured under tail-coverts are thus prominently displayed."[4] The female meantime settles down—and according to Mr. Brock—in the scrape the male has just left. Her action when scraping is similar to that of the male, but less energetic, and she is more prone to settle quietly as though brooding. The male meanwhile maintains the displaying pose, occasionally plucking up herbage and tossing it over his shoulder. Frequently while in this position he rocks his tail up and down and lifts the points of his wings, as he does when scraping, and also utters a low creaking note. Mr. Brock describes another pose adopted by a male should he approach a female on the wing: "In such a case, on settling close beside her, he momentarily takes up a very erect attitude, towering over the other bird, his breast feathers puffed out to their fullest extent, and the long crest inclined forward."[5] This is followed by periods of scraping and displaying in the more usual pose.

At first the female is apt to lose interest in the proceedings, although for a while she may take turns with the male at working in a

[1] See also *Bird-life Glimpses*, p. 165; and *Zoologist*, 1911, p. 300.
[2] *Zoologist*, 1911, p. 301.
[3] *Ibid.*, 1911, p. 302.
[4] *Ibid.*, 1911, p. 302.
[5] *Ibid.*, 1911, p. 301.

scrape. Mr. Brock states that "On the lapse of a day or two thus spent the scraping antics become less frequent, and the birds are content to remain quietly in each other's company, usually at no great distance from the scrapes. . . . On the occurrence of coition, however, which first takes place a few days before egg-laying, a renewed activity is shown. Immediately following this rite the female proceeds straight to the scrape, and works in it with energy and thoroughness hitherto unequalled, the male frequently taking his place in a neighbouring scrape. Between her bouts of energetic foot-work the female plays with stubbles, jerking them over her shoulder." Mr. Brock thinks that the scrape in which the female works immediately after coition is the one eventually adopted as a nest, in which the eggs are laid; I understand him to say that he has known this to be so in some cases.[1]

Mr. Selous describes their actions at this period in similar terms, but on two occasions after pairing took place—on one of which the male flew down and paired with the female without previously alighting, the male ran for a short distance in the attitude in which the head and neck are held in a line with the body and then pitched forward and commenced to roll. The female followed, and on the male moving forward and sinking down again apparently in another scrape, she took his place in the first one, pecking at the ground in front of her as she worked.[2]

In the displaying pose, and when scraping near his mate, the male generally contrives to present his back view to her, so displaying the brightly coloured under tail-coverts.[3] From my observations I should pronounce this to be almost invariably the case. But whether the object is to display this part of the plumage it is difficult to say. The female is equally well endowed, so far as the colour of the under tail-coverts is concerned. As a rule, when male birds deliberately exhibit some part of their plumage in courtship, it is a part that conspicuously distinguishes them from the female. In fact, if sexual selection goes

[1] *Zoologist*, 1911, pp. 302-3.
[2] *Bird-life Glimpses*, p. 165.
[3] See also *Zoologist*, 1911, p. 302; and *Bird-life Glimpses*, p. 167.

for anything, the particular plumes owe their beauty or distinctive appearance to having been so displayed. The courting actions of birds often appears like a desire to display some particular part of their plumage, when no such object may exist.

The scraping and displaying actions of the lapwing certainly appear to be involuntary, and, as argued by Mr. Selous—the direct result of sexual activity or excitement, and his expressed belief, that out of such frenzied impulsive actions the more elaborate cases of sexual display have arisen, appears reasonable.[1] The uptilted attitude of the male lapwing may be a more elaborate phase of his frenzied working in the scrapes, during which the tail is often held straight up. Another apparently involuntary or purposeless action is the plucking of nest material and throwing it about, often over the shoulder.

Although a lapwing's nest is often but a scantily lined hollow, good substantial nests may frequently be found. In such nests the lining is carefully worked in, and may be as much as an inch in thickness. Usually the greater part of the lining is added after the first eggs are laid, as in the case of other species. I once found two or three nests in the fens, built on long grass and rushes of the previous year's growth, and which was matted together and beaten down by the winter weather, forming a platform over boggy ground; in one case there were six or more inches of water underneath. The nests were large and built of grass straw, with finer bents by way of lining. They were quite conspicuous even at a distance. As the situation did not lend itself to scraping, it is unlikely that these nests can have originated in the usual way.

I have perhaps devoted an undue proportion of this chapter to the habit of forming additional nest scrapes. But the habit is more pronounced in the lapwing than in other Waders, and, moreover, the species is comparatively easier of observation; the ground actions of less conspicuous species are considerably more difficult to witness, and one can only surmise by analogy—not always a safe guide—that the

[1] *Bird-life Glimpses*, p. 168.

extra scrapes of other species play a similar part in their spring activities as do those of the lapwing. It is to careful observation of such habits that we must look for a better understanding of the origin of nest construction and sexual display.

However important the scrape forming and courting actions which take place on the ground may be, from a spectacular point of view they pale before the more obvious and beautiful aerial evolutions which are so charming a feature of the lapwing's spring activities. These evolutions may take the form of a spring or nuptial flight of fairly well defined character, aerial contests between rival males, and also a flight which may be a phase of the latter, but the behaviour of the birds gives no indication of rivalry, rather of play and the joy of flying together. Were it not that it may be witnessed long before pairing is accomplished, I should be tempted to regard the last-mentioned flight as a marriage flight, in which male and female take part. Very frequently these flights are participated in by three, sometimes more, birds, but three are commonly seen.[1] Skimming over the ground, the birds rise and fall, tilt from side to side in a manner somewhat similar to, but not so elaborate as, the wonderful evolutions performed by the male in its spring flight. But there appears to be no rivalry or jealousy, for although two may be flying side by side with a third a little behind, they may close up and change places quite indiscriminately and without discord. They follow and repeat each other's actions as in the winter flights, so that the true solution doubtlessly is that it marks a transitional stage from the social condition of winter, in which the spring fashion of flight is asserting itself. Very similar conditions mark the early spring habits of other species, which partly abandon the gregarious state at pairing time. The redshank, snipe, and ringed-plover provide examples.

The spring-flight proper runs a more regular course, especially when the performer is uninterrupted by other birds. He rises from the ground with slow heavy flaps of his broad wings, as though he has

[1] See also *Bird Watching*, p. 82.

difficulty in getting under way; this is belied by a sudden upward rush or sweep, an effortless turn in which the wings hardly take part, and then a downward sweep or fall, with half-closed wings, at the end of which the bird seems suddenly to awake to the necessity of wing action, flings his wings round in a wild whirl—in which he sometimes appears to throw a partial somersault [1]—and the next instant is away over the ground with musical wing-beats, tilting and swaying first to one side, then to the other, with marvellous buoyancy. It is during this flight that the breeding song may be heard. It has been well rendered by Mr. Brock as "*whey-willuchooee-willuch-willuch-cooee.*" [2] It has also been rendered "*coo-oo-oo, hook-a-coo-ee, coo-ee*" [3] and "*co-u-whee-whee-whee, co-u-whee.*" [4] The "*willuch-willuch*" is very characteristic, and makes Mr. Brock's rendering the most faithful, but the "*coo-ee*"—in my opinion—requires a *w*, "*coo-whee.*" The song accompanies the upward sweep and fall through the air. It suffers a break during the flutter of wings at the end of the fall, but is picked up at once with a triumphant "*coo-whee coo-ee,*" as the bird dashes off in the wing-humming part of its flight.

The aerial combats or games, constantly taking place in a field inhabited by several pairs of lapwings, are characterised by similar evolutions in modified form. Two birds so occupied will sometimes rise to a great height in their efforts to get above each other, and one succeeding in this may "stoop," when, unless the lower bird dodges, there may be a wing-clap or two. Except for this they appear to be sporting with each other, and for the most part only at a moderate height from the ground. They tilt and twist, first one leading, then the other; they mount up together and towards each other with flurrying wing action, and then sweep downwards and away in opposite directions. The spring notes are constantly uttered "*willuch-oowhee,*

[1] Mr. Brock describes this manœuvre thus: "the performer throws himself sideways almost on his back, instantly recovering himself with a flurry of wings" (*Zoologist*, 1911, p. 298); and Mr. Selous states that the bird "turns right head over heels" (*Bird Watching*, p. 26).

[2] *Zoologist*, 1911, p. 298.

[3] Selous, *Bird Watching*, p. 25.

[4] Boraston, *Nature Tones and Undertones*, p. 148.

willuch-willuch," with occasional periods of wing-humming.[1] The whole performance suggests exuberance of spirits rather than real rivalry. It is continued even after the eggs are laid.

Real hostility is displayed if a male encroaches on the domain of another. The fighting, as a rule, is one-sided, the bird that is encroached upon attacking the trespasser with great persistency, swooping from all directions at him as he stands on the ground. The bird so attacked avoids the rushes aimed at it by well timed upward springs, allowing the other to pass beneath it, or by swerving to one side, always endeavouring—or appearing to do so—to keep to the ground.[2] The attacker does not desist until he has forced the other into flight. The latter seems to act almost entirely on the defensive, but often with such obstinacy that the struggle may last—according to Mr. Brock—as long as an hour or an hour and a half on end.[3] The amount of territory each bird reserves to itself varies considerably; two nests are found occasionally very near to each other, but as a rule they are a good distance apart. Encroachment is the chief cause of squabbles. Mr. Brock has noticed that the males are very jealous of each other when scraping, and for one to scrape when another is near is sure to result in hostilities. The same cause will produce a fracas between two females, and Mr. Brock states that he has several times observed "encounters between two females ended by a male bird rushing up and separating the combatants, and, not content with terminating the strife, he attacks one of the females, driving it to some distance," and "on one occasion a male, which was courting a female bird, suddenly desisted to attack and pursue a second female at a little distance."[4]

The male has been seen to approach the nest, after an egg had been laid, "as though with the intention of scraping, but on reaching it he contented himself with standing erect over it, moving his tail gently up and down and plucking at straws."[5] He does not apparently work

[1] See also *Zoologist*, 1911, p. 298.
[2] See also Selous, *Bird Watching*, p. 30; and *Zoologist*, 1911, p. 299.
[3] *Zoologist*, 1911, p. 299. [4] *Ibid.*, 1911, p. 301. [5] *Ibid.*, 1911, p. 304.

in the nest again, or sit on the eggs until all are laid, but afterwards he bears his full share in the duties of incubation, and also keeps watch, and warns the sitting female of danger.

When a breeding-ground is invaded, the males fly off somewhat ostentatiously, while the hens, after leaving their nests, run for some distance, and then flap quietly away, but a few feet above the ground. It is not, however, by any means a hard and fast rule that sitting lapwings always run before taking flight. It depends to a certain extent on how near one approaches without being discovered. Their watchfulness, and the open nature of the places where they generally nest, guards, as a rule, against a near approach, but the conditions may sometimes assist to a sudden surprise, and then the birds may be seen to fly straight from the nests. But it depends more, I think, on which bird is sitting. The female is more secretive in her habits, and is nearly sure to run, unless suddenly put off, but the male almost invariably flies straight from the nest.[1] The same distinction between the methods of male and female obtains with other species of Waders. If the eggs are fresh the breeding-ground will be quite deserted by the birds until the intruder leaves, but if incubation is far advanced the birds will circle around, or fly to and fro with querulous cries. They follow the intruder until he is clear of the breeding-ground, then ceasing their cries they sweep round and fly rapidly back. When the young are hatched the old birds become very bold and noisy in their distress. They circle round an intruder and occasionally swoop as if they are going to strike; but their usual method is to fly to and fro, quickening their pace when near, making music with their wings, and repeating at monotonous intervals their rasping alarm-note "*pee-ee-yit.*" The young birds meanwhile crouch low, and being endowed with highly protective pattern and colour are comparatively safe. They remain quite still unless handled, or the herbage close to them is disturbed, when they run off generally in different directions. Once they have been disturbed it is very difficult to make them settle down

[1] See also *Field*, 1892, vol. lxix. pp. 79, 545, 585, 625, 666.

quietly again. I have seen one that was partly feathered crouch, but at this age they have generally outgrown the habit.

It has often been said of the lapwing that it resorts to the "injury feigning" display to save its eggs or young. Personally I have never yet seen the slightest display of this kind. I would not, however, on that account describe the belief as a "popular fallacy," as was done in the *Zoologist* for 1897, p. 473. The habit occurs no doubt, but rarely, and in a later number of the same magazine Mr. Bernard B. Riviere records seeing two lapwings "feigning injury," running with drooping wings, and occasionally toppling over on to one shoulder, with wings flapping feebly. When approached they flew up.[1] In this case the birds had young. A lapwing flushed from the nest has been observed to display.[2]

Lapwings are exceedingly bold in attacking and mobbing hawks, crows, or rooks venturing near their nesting-grounds. One may often see a solitary crow, apparently doing nothing more offensive than taking a short cut home across a piece of fen country where lapwings are nesting. Until clear of the breeding-grounds, his course is marked by sorties against him by angry lapwings. Flying suddenly up from the ground, a lapwing chases and buffets at him, the crow dodging to avoid the blows and endeavouring to maintain his course. No sooner has one lapwing turned back, than up flies another, and so on, each one—as it were—conducting the crow to the frontier of its own domain, and handing him over to its nearest neighbour. But their resentment is not only against species which may with reason be suspected of predaceous intent. They appear to have quite an unreasonable objection to partridges. Several instances have been recorded in which lapwings have attacked and driven partridges from their nesting-grounds.[3] A contributor to the *Field* related how a blackheaded-gull was mobbed almost to death by lapwings.[4] They will also attack cattle; in an encounter with a cow, one is said to have

[1] *Zoologist*, 1902, p. 29.
[2] *Ibid.*, 1897, p. 515.
[3] *Field*, 1903, vol. ci. p. 950; *Ibid.*, 1904, vol. ciii. p. 861.
[4] *Ibid.*, 1904, vol. ciii. p. 861.

alighted on the ground "and flapped its wings over its back close in front of the cow's nose." The cow, either annoyed or interested, followed the bird, and so was lured to a safe distance from the nest. Another was seen to attack and drive away a flock of geese.[1]

The Rev. F. C. R. Jourdain states that he has often found remains of dead lapwings on the breeding-grounds, and as he once found a sternum of one on an old nest—used as a "dining-table"—of a sparrow-hawk, and has witnessed at nesting time an unsuccessful attempt by a sparrow-hawk to kill a lapwing, he believes this hawk to be responsible for the death of the lapwings whose remains he has found.[2]

Although I have never tested it myself, I have been told by farmers that lapwings will continue to sit if their eggs are moved a yard or so from where they were laid, and placed in a hand-made depression. This is occasionally done to save them when a field is being harrowed in the spring. One bird continued to sit although her eggs were moved more than once. This bird was exceptionally devoted, for a heavy snow-storm covered the eggs, and she was found sitting, although there was but a small hole in the snow through which the eggs could be seen. The bird's wing feathers were bound with frozen snow so that she could not fly, but when she was released and the snow cleared from the eggs, she returned to them and continued to sit.[3]

Incubation takes about twenty-six days. Eggs hatched in an incubator on the 25th, 26th, and 27th days, while a clutch hatched naturally in the nest on the 26th day from the time when the last egg was laid. The eggs are not always laid on consecutive days, but incubation does not commence until the clutch is completed. In one instance three days elapsed between the laying of the third and fourth eggs.[4] Although the clutch normally consists of four eggs, five are occasionally found. I have seen three nests, each containing five

[1] *Field*, 1903, vol. ci. p. 997.
[2] *Zoologist*, 1904, p. 104.
[3] *Field*, 1892, vol. lxxix. p. 625.
[4] *Ibid.*, 1882, vol. lix. p. 285.

PLATE XI.

Lapwings

By A. W. Seaby

eggs. The young do not leave the nest for twenty-four to forty-eight hours after they are born, unless disturbed.

Especially when wounded, lapwings will take to water, and swim well. A large number were observed in December 1894 resting on the water in Lough Derg, Co. Limerick.[1] Young birds in down have also been seen swimming;[2] on one occasion a brood was seen crossing a river while the parents circled above.[3]

Mr Robert Warren states that he has often seen lapwings take to water when hard pressed by peregrines, and in one instance one was taken from the water by the hawk, a most unusual proceeding. He once watched a splendid flight of a peregrine at a lapwing. The latter was so exhausted by its efforts in eluding the hawk, that when it at last dropped into the water and swam ashore it allowed itself to be caught by the observer. The peregrine "waited on" and swooped when the lapwing was held up. It followed close until the lapwing was liberated in some cover, when the hawk went off.[4]

Young lapwings—and also other Wader species—sometimes come to grief by sheep's wool becoming entwined round their toes, on which the damp earth accumulates until a ball is formed that incapacitates them from walking.[5] By no means infrequently, the wool, closely entwined, causes amputation of the toes.[6]

Flocking commences as soon as the young can fly,—in fact, it may be said, in some cases, to commence before. I once saw many broods of young lapwings of all ages running about on some fallow-land in Suffolk, while the parents, some on the ground, some flying, were in such numbers as to constitute a flock. Some of these broods must have been hatched a good distance away, and were conducted to this part probably because suitable food was plentiful. The flocks of old and young birds combined leave the nesting-grounds in July, and in autumn are joined by the large flocks from Northern Europe. Their

[1] *Field*, Dec. 29, 1894.
[2] *Ibid.*, 1906, vol. cvii. pp. 595, 643.
[3] *Ibid.*, 1902, vol. xcix. p. 893.
[4] *Zoologist*, 1904, p. 389.
[5] *Field*, 1884, vol. lxiii. p. 879; and *Ibid.*, 1899, vol. xciii. p. 907.
[6] *British Birds* (magazine), ii. p. 302.

migratory movements are fully described in the "Classified Notes" at the head of this chapter. Like the golden-plover, lapwings are largely influenced in their winter movements by the weather. During severe frost they resort to the sea-coast, and feed at low water on the sands and mud-flats, but while the weather is open they prefer the marshes and cultivated fields. The large flocks are very difficult of approach, being, if anything, more shy than the golden-plover. The lapwing is easy to distinguish on the wing; it can travel at a great pace, but with regular beats of its broad ample wings, very different to the rapidly driven pointed pinions of its congeners. When lapwings and golden-plovers fly together, the two species keep in separate groups. Flocks formed of groups of these two species may often be seen, and their mingled cries may be heard at night, both being regular night feeders.

It has been stated that the lapwing stamps on the ground beside a worm-cast, in order to make the worm come up to the surface; also that it frequents the haunts of moles for the worms driven to the surface by the burrowing of the moles.[1] Latham—quoted by Yarrell—says, "I have seen this bird approach a worm-cast, turn it aside, and after walking two or three times about it, by way of giving motion to the ground, the worm come out, and the watchful bird, seizing hold of it, draw it forth."[2] It requires but little experiment to show how slight a disturbance of the ground will suffice to bring worms to the surface, and it is not surprising that lapwings should learn to take advantage of it. It is quite probable that probing birds gain much of their food by reason of this fact—not by "stamping," but by driving their bills into the soft earth.

[1] Romanes, *Animal Intelligence*, pp. 285-6.

[2] Yarrell, *British Birds*, iii. p. 285.

5. THE CURLEW AND THE WHIMBREL

PRELIMINARY CLASSIFIED NOTES

[BY W. P. PYCRAFT. F. C. R. JOURDAIN. A. L. THOMSON. W. FARREN]

COMMON-CURLEW [*Numénius arquátus* (Linnæus). Whaup, stock-whaup (Scotland). French, *courlis cendré*; German, *grosser Brachvogel*; Italian, *chiurlo maggiore*].

1. **Description.**—The curlew is readily distinguished by its large size, brown striated plumage, and long decurved beak. There is a slight seasonal change of coloration, and the sexes are alike. (Pl. XLIII.) Length 26 in. [660·38 mm.]. The adult, in nuptial dress, is of a pale creamy brown, heavily striated with darker brown on the head, neck, and under parts, which are white. The mantle is of a darker brown, owing to the broadening of the central dark areas of the feathers, and glossed with green, but the hinder scapulars and long inner secondaries are barred with brown. The rump is white, and the shortest upper tail-coverts are white streaked with dark brown, the longest white, suffused with rufous and barred with dark brown. The central tail feathers are pale brown barred with darker brown, the outer white barred with brown. The primaries are dark brown, the outermost with white bars across the inner webs; the innermost with white bars across both webs; while the secondaries are barred with brown and white. The breast, abdomen, and under tail-coverts are white, the latter finely striated with brown. Beak fleshy brown, legs pale slate-grey, iris hazel. The female is somewhat larger than the male, and has a longer beak. After the autumn moult the striations on the under parts and the bars on the flanks are narrower, the upper parts are somewhat paler, and the upper tail-coverts less barred. The juvenile plumage differs from the summer dress of the adult in being somewhat more rufous on the upper parts, and has the bars on the scapulars and inner

secondaries more sharply defined, while the dark central areas of the feathers of the mantle show a tendency to form marginal bars, giving a more chequered appearance to the plumage. The under parts are more markedly barred and striated, and the ground of the neck and breast inclines to rufous; the flanks also have a rufous tinge. The young in down are of a pale buffish grey obscurely mottled on the upper parts. [W. P. P.]

2. Distribution.—At the present time the curlew breeds on the moors of Cornwall, Devon, and Somerset, in small numbers in Dorset, Wilts, and Hants, and occasionally in Surrey, while a nest was found in Norfolk in 1910. It is tolerably common in Wales, and also breeds in the Border counties; a few pairs breed on the heaths of Staffordshire, and from the Derbyshire moors northward along the Pennine range, and on some of the low-lying moorlands in the northern counties. It nests in the Isle of Man, and is widely distributed over the mainland of Scotland and the Inner Hebrides, as well as on the Orkneys and Shetlands, but apparently not on the Outer Hebrides. In Ireland it is common both on the mountains and in the bogs. On the Continent it breeds on the moors of Brittany, Belgium, and Holland, locally in N. Germany and Bavaria, Carniola (?), Austria, Galizia, and in Russia in the Baltic provinces, Poland, and from the Perm government on the east to the Varanger Fjord, the Dwina delta, and the Lower Petschora ($65\frac{1}{2}^\circ$ N.) in the north. In Denmark it breeds in Jylland, and in Scandinavia on the west coast of Norway, and in Sweden to Jemtland. East of the Kirghis steppes in Asia it is replaced by an allied race, which ranges to Lake Baikal, while another species (*N. cyanopus*) is found in Eastern Siberia. There is some evidence that it has bred in the Canaries. On migration it occurs through Europe west to the Azores and Canaries, and winters in Africa and Madagascar south to Cape Colony and Natal; Asiatic birds wintering in Southern Asia to the Indian Ocean and the Malay Archipelago (Borneo, Java, and Sumatra). [F. C. R. J.]

3. Migration.—A resident and a winter visitor. In the inland districts where it breeds it is only present from March or April till July or August, but on the coast, where immature birds are to be met with during the breeding season, it is known all the year round. From August till the middle of November a considerable influx from Northern Europe takes place on the eastern seaboard of Great Britain (cf. Nelson, *B. of Yorks.*, 1907, p. 644). For the evidence of southward passage or emigration see p. 418. A gregarious and at least partially nocturnal migrant. [A. L. T.]

4. Nest and Eggs.—The nest is a mere depression in the ground, lined with

Photo by J. Cyril Crowley

Curlew alarmed and crouching in its nest

Photo by F. Heatherley

Young curlew within five hours from hatching

bents and dead grasses, and may be found on rough pasture, or tussocks in marshes, among heather, or on burnt patches of moorland. Probably the scanty material is collected by the hen, but observations on this point seem to be wanting. (Pl. XLII.) The eggs are normally 4 in number, but several clutches of 5 are on record, and 3 are not uncommon in second layings. They are very large, broad pyriform in shape, and placed with converging points. The ground-colour ranges from light green to olive-green or olive-brown, but exceptionally eggs of clear blue-green without spots have been met with. The normal markings are blotches of light or dark umber-brown with underlying light ashy-brown shellmarkings. Average size of 80 eggs, 2·65 × 1·86 in. [67·4 × 47·3 mm.]. Both sexes take part in incubation, though the female appears to take the greater share of the work, and a male shot by Slater showed no hatching-spots. In an incubator the eggs hatched early on the 30th day (W. Evans). The breeding season is about the third week of April in England and Wales, though exceptionally eggs have been found early in April even in the north. In the Shetlands, however, the usual time is from mid-May onward to the end of June, though eggs have been taken exceptionally on 2nd May. Only one brood is reared in the season. [F. C. R. J.]

5. Food.—Insects of various kinds and their larvæ, earthworms, snails, slugs and other molluscs, and berries. The Rev. H. H. Slater states that it is fond of the fruit of crowberry—*Empetrum* (*British Birds, their Nests and Eggs*, v. p. 174), and Professor Patten quotes instances of blackberries being eaten in large quantities. One stomach examined was filled with this fruit, the juice of which had stained the intestine (*Aquatic Birds*, p. 363). On the shore they are very fond of small mussels and other molluscs and sand-worms, and, in fact, almost any moderate-sized invertebrate animal. Swallows sand and grit. The young feed chiefly on insects and their larvæ, and they are accompanied and no doubt aided in their search for the same by both parents. [W. F.]

WHIMBREL

[*Numénius phœopus* (Linnæus). May-bird, half-curlew, seven-whistlers, jack-curlew, curlew-knave, peterel, titterel; sprowe (Norfolk); curlew-whilp (Lancs.); tang or peerie-whaup (Shetlands); checker and checkerel (Somerset); little-whaup (Orkneys). French, *courlis courlieu*; German, *Regen-Brachvogel*; Italian, *chiurlo piccolo*].

1. Description.—The whimbrel is to be distinguished from the curlew chiefly by its much smaller size and the median whitish band down the crown.

There is no seasonal change of coloration, and the female is larger than the male. Length—male, 16 in. [406·4 mm.]; female, 18 in. [457·2 mm.]. (Pl. XL.) The coloration of the upper parts differs from that of the curlew in having pale supraorbital and median bands on the crown, and the pale margins and bars of the mantle greyer and less sharply defined, while all the tail feathers are pale brown barred with darker brown. The under parts differ mainly in that the bars of the hinder flank feathers are more pronounced and the axillaries more barred. The beak is of a dark horn colour, the legs and toes dull slate-grey, the iris hazel. The juvenile plumage differs from that of the adult rather more markedly than is the case with the young curlew, the interscapulars and scapulars, and the long inner secondaries being dark brown, spotted along their margins with buff, while the ground-colour of the wing-coverts is buff, not white, and the rump is more or less distinctly striated. The young in down are hardly distinguishable from those of the curlew, but have the upper parts more distinctly striated, especially on the head and neck. [W. P. P.]

2. Distribution.—In the British Isles the whimbrel is only known to nest on some of the Scottish islands. In the Outer Hebrides one or two pairs apparently breed on N. Rona, and it has been observed in summer in the Uists. It is only found in small numbers on the Orkneys, but in the Shetlands, though very local, it is not uncommon in certain localities, especially on Hascosay. Outside the British Isles it breeds on the Færoes and Iceland. On the Continent it nests on the fjelds of Scandinavia from Jaederen to Finmark in Norway, and from Jemtland to the Lapland border in Sweden; while in Russia it breeds in Northern Finland, rarely in the Dwina valley, and commonly in the governments of Kazan, Samara, Ufa, Perm, and Orenburg. Buturlin adds that it is said to nest in Pskov, and possibly also south to Voronesh, Kieff, and the middle Ural valley. In Siberia it is found in Tobolsk and east to Tara, but in E. Siberia is replaced by an allied form. A few pairs are also said to breed sporadically in Pomerania and E. Prussia. On migration it occurs through Europe, and winters in South-western Asia east to India and Burma, Madagascar, and tropical and South Africa, where it has been recorded south to Cape Colony. The eastern race migrates through South-east Asia to Australia. As a casual it has occurred on Jan Mayen, Greenland, Madeira, the Azores, and Canaries. [F. C. R. J.]

3. Migration.—Chiefly a bird of passage to our coasts, but also a summer visitor in small numbers (cf. preceding paragraph); a few may sometimes remain during the winter. In Ireland some of the great lakes and bogs are regularly

visited on passage as well as the seaboard (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 310). The spring passage in this species, contrary to the usual rule, is much more marked than the autumnal: the former lasts for about six weeks from the middle of April onwards, and is at its height about the second week of May. A few birds, apart from those breeding, are sometimes found during the summer in various parts. The return passage begins in the latter half of July and lasts till September, after which few birds are met with. The whimbrel is a gregarious migrant, but seldom forms large flocks, while in autumn it associates also with curlews, godwits, and the like. It journeys both by night and by day. In autumn it is apt to be scarce and local, but individuals may linger for a long time; in spring it is seldom seen to alight, and then only for a short time, being more often recorded as passing high overhead "in compact little flocks during the midday hours" (Solway; cf. Service, *Trans. Nat. Hist. Soc. Glasgow*, 1905, vol. viii. p. 59). [A. L. T.]

4. Nest and Eggs.—The nest is merely a shallow depression, frequently close to a boulder or stone on a moor or on a hummock in a marsh, lined scantily with fragments of mosses, especially *sphagnum*, bents, and lichens growing around, apparently picked by the hen-bird while laying or incubating. The eggs are normally 4, sometimes only 3, in number,[1] and are large, broad pyriform in shape, and placed with converging points. The ground-colour varies from olive brownish or greenish brown to bright blue-green, blotched irregularly with sepia-brown, sometimes almost blackish brown, with underlying ashy grey shellmarks. The markings are usually heavier at the big end. Average size of 63 eggs, 2·30 × 1·61 in. [58·5 × 41 mm.]. Both sexes show brooding-spots and take part in incubation, the hen usually, but she is relieved at times by her mate, especially in the evenings (Hantzsch). The same authority also gives the duration of the period as three to three and a half weeks. In Iceland the eggs are generally laid in the first half of June, sometimes in the last week of May in the Færoes and islands of Scotland, and in Lapland from about 6th June onward, and even in July, though only a single brood is reared during the season. [F. C. R. J.]

5. Food.—Insects and their larvæ, worms, land-snails, and berries; and on the shore, sand-worms, molluscs, and the smaller crustaceans. Is less of a marine feeder than the curlew, and leaves the shore to feed on the adjacent cultivated fields (Slater, *British Birds, their Nests and Eggs*, p. 177). In the stomach of females from Achill Island in May, Professor Patten found remains of numerous

[1] Hantzsch records a nest with 5 eggs (*Vogelwelt Islands*, p. 256).

beetles, and small brown larvæ (*Aquatic Birds*, p. 368). The young feed chiefly on insects and their larvæ, and are accompanied and no doubt aided in their search for the same by both parents. [W. F.]

6. THE CURLEW AND THE WHIMBREL

[W. Farren]

The curlew and whimbrel are distinguished from all other British Waders by their long curved bill. They are also, with one or two exceptions, of a far more robust build, and the curlew is in every way larger than any other species. Both nest with us. The curlew is one of our commonest resident Waders, breeding from one end of the British Isles to the other, wherever suitable moorlands occur—owing to the absence of these it does not breed, except on rare occasions, in the south-eastern and eastern counties up to Yorkshire—and is an abundant bird of passage in spring and autumn.[1] The whimbrel, although plentiful on passage in spring and autumn to and from its northern breeding-places, is restricted as a comparatively rare nesting species to some of the Orkneys and Shetlands, and has only very occasionally been found in winter.

The distribution of the two species is interesting by reason of a remarkable parallelism in the variation of closely allied species, subspecies, or local forms throughout the northern hemisphere. Curlews and whimbrels occur in Europe, Asia, and America, and although the whimbrels—the smaller species—are always the more northern, the curlews overlap them as in North Britain. Our birds extend eastwards to Asiatic Siberia, where both species are replaced by doubtfully distinct forms, with more heavy barrings on the white of the lower back and rump. These forms continue to Japan and China, and in winter migrate southwards to the Malay and Australian regions. In America we find representatives of both species, and these are distinguished from the old-world birds by the rufous colour

[1] It has been occasionally recorded as nesting in Norfolk. For one record see *British Birds* (magazine), iv. p. 88.

of the axillaries and other under wing feathers. Other species exist, but it is unnecessary to mention them here.

The whimbrel, unlike most species, is far more numerous with us on the spring than on the autumn passage.[1] Dr. Ticehurst thinks that this is due to the fact that in autumn many flocks pass high overhead without stopping on the coast, as of all the Waders the cries of the whimbrel are most frequently heard, and are most easily recognised.

Our resident curlews leave their inland breeding-places for the coast in July and August, going, as a rule, to the estuaries nearest to their nesting-places; as the autumn advances many of them move southwards, others from farther north filling their places. Fair numbers, however, reach the eastern and southern counties by the beginning of August or even earlier. In 1909 numbers were heard at night in Hertfordshire on July 14th and 15th, and in Norfolk on the 24th and 25th; and the first arrivals were observed on the East Sussex coast on the 19th.[2] Dr. Ticehurst says that in Kent the first birds arrive in August.[3]

The first curlews that arrive in East Anglia from the Continent in August are small bands of immature birds with a few adults. The bulk, in flocks of considerable size, do not arrive until September and October. These are said to be generally smaller, and to have longer bills than the home-breeding birds. In East Norfolk they are known as "harvest curlews," and are, owing to their having fed inland, esteemed by wild-fowlers as being better flavoured than those that have fed on the shore for some time.[4] Immigration continues to November, but Dr. Ticehurst considers that in Kent most of the migrants have passed by the beginning of October, leaving behind the regular winter residents.[5] Overseas emigration in autumn probably

[1] Ticehurst, *Birds of Kent*, p. 486; Patterson, *Nature in Eastern Norfolk*, p. 241; Ussher and Warren, *Birds of Ireland*, p. 310.
[2] *B. O. C. Migration Report*, 1911, xxviii. p. 256.
[3] *Birds of Kent*, p. 458.
[4] *Nature in Eastern Norfolk*, p. 240.
[5] *Birds of Kent*, p. 485.

consists of a large proportion of the home-reared birds, with some from Northern Europe. This is a point, however, upon which more light will be thrown with the extension of the system of "ringing" nestlings.

The return migration commences as early as the end of February, continuing throughout March and April and well into May. The earliest arrivals are almost certainly part of our breeding stock, and they repair, as they arrive, to their inland nesting-places. Long after they have settled on the moors the full stock of winter residents may be seen on the coasts. The date of the latest arrivals from overseas overlaps the beginning of the emigration of our winter residents, which takes place in the end of March and continues throughout April and May. By the end of the latter month the only curlews left on the coast are non-breeding birds, which remain for the summer.

The first curlews may be seen on most British breeding-places quite early in March. They remain in flocks up to the beginning of April when mating commences, and by about the middle of the month they will have dispersed in pairs over the usual nesting areas.

Although the curlew is a common and familiar nesting species, yet its watchfulness, and the open nature of the country it frequents, makes observation of it, while on the ground, exceedingly difficult. Consequently, whatever there may be in the form of courting-display is yet to be recorded. A number of false nests, or rather additional scrapes, may almost invariably be found in the neighbourhood of each real nest. Mr. Owen R. Owen tells me (*in litt.*) that in parts of Radnorshire, where the curlew breeds commonly, it is not unusual to find as many as two or three dozen scrapes in an afternoon. If these scrapes are formed under conditions similar to those prevailing with the lapwing, then close observation of the curlew in early spring would be well repaid.

The aerial evolutions of the male peculiar to the breeding season are obvious enough and well known. The performance, with its accompanying trilling song, resembles somewhat that of the redshank

and some other closely allied Waders. I have described these Wader song-flights as peculiar to the male, but it may prove that the female, at least occasionally, also performs. The curlew, especially in the end of April and beginning of May, and more commonly towards evening, indulges very frequently in its spring flight. It rises from the ground, and with rapid wing-beats ascends to a good height. Often when near the summit of its flight it checks suddenly, almost throwing itself over backwards. Recovering, it hangs poised kestrel-like in the air, and while so hovering, and also during a short temporary drop on motionless wings, it pours forth the trilling or jodelling song. It rises again on quivering wings and again sinks as before. This may continue for some time, or it may be varied by the bird circling round on extended wings, when one is again reminded of the flight of a hawk. More often than not the bird will stop before a circle is completed, and hover again over a fresh spot. So it continues, circling, rising and falling and pouring forth a joyful ripple of song. If there are times when the curlew and its wild call-notes harmonise with—even add to—the sense of desolation of the moorland scenery, conjuring up visions of "witches and warlocks and a' lang-nebbed things" to the superstitious Highlander, and when the light flashes of its under wing feathers seem merely

"Dreary gleams about the moorland,"

yet when the breeding song is in full force, it is so full of virile life, that for the time it dominates the influence of its surroundings and brings the full joyfulness of spring to the wild moorlands.

The song consists of two—or three—rising notes, rapidly repeated, high pitched, but liquid and flute-like. Although I may be needlessly adding to an already long list of inadequate renderings—inadequate, that is, to convey an impression of the sound to those who have never heard it—I would express the curlew's song as "*gur-lech gur-lech gur-lech gur-lech*," pronounced rather distinctly at first and not too quickly, but quickening after the first two or three repetitions. Towards the

end the syllables must be almost run together, losing all of the first except the "g," and at no time sounding the "ch" too hard, but rather as in the Scottish "loch." I am aware that my rendering of this note differs considerably from some published formulæ, the majority of which are variants of the syllables "*wi-wi wiw-i-wiw*," etc. Mr. Selous says the note is first a melancholy "*too-ee too-ee too-ee*," then a much louder and sharper "*wi-wi, wi-wi, wi-wi*" (the "i" as in with).[1] Seebohm describes two distinct notes at the nest; a call-note "*ker-lee*"—other variants of this are "*cour-lie*" or "*cour-lieu*," from which the species gets its name—and a note which he renders as "*wiw-i-wiw-i-wiw*," and which he states is unquestionably the alarm-note.[2] On the other hand, it has been stated that the quivering whistle which the birds utter as they fly towards an intruder on their nesting-grounds is not *merely* a warning-note, as it is also freely uttered during the soaring flight.[3] Dr. Heatherley, while likening the trilling song to "jodelling on a flute," says (*in litt.*) that when in great alarm—*e.g.* when their young are endangered—the bird's cry is "*whi shishi.*"

The apparent discrepancy of these various renderings is, I think, due to the probability that the spring song is a modification of the call and alarm-notes, and fine discrimination is needed to separate them. Mr. Owen, who has for many years been familiar with the curlew in Radnorshire, gives me (*in litt.*) an entirely independent rendering of the alarm-note uttered angrily by the birds while they fly over the head of an intruder when they have young, as "*guck, guck, guck, guck.*" A similar alarm-note is used earlier in the season, but uttered far more quietly.

The winter call-note of the curlew is, in my opinion, best expressed by Mr. Patterson as a mellow "*quoi, quoi.*"[4] It may correspond with "*whee-ou whee-ou*" or "*wha-up*," renderings given by Mr. Harting.[5] Mr. Patterson states that he has found it possible to judge by its cry how a curlew is employed. He distinguishes notes signifying alarm,

[1] *Bird Watching*, p. 141.
[2] Seebohm, *British Birds*, iii. p. 96.
[3] Ussher and Warren, *Birds of Ireland*, p. 309.
[4] *Nature in Eastern Norfolk*, p. 240.
[5] *Birds of Middlesex.*

caution, satisfaction, anger, anticipation, etc., and says that when living in his house-boat on Breydon during the month of August, he has noticed some eleven or twelve distinct notes or calls.[1] He mercifully abstains from rendering them all in words!

From these renderings it is of interest to turn to those in German of Naumann. At first sight they appear to differ so absolutely from the English renderings as to be impossible of association with them, but with correct German pronunciation they may be made to correspond. They give, moreover, a more musical impression; for instance, "*taü taü taü*" and "*tlaüid tlaüid*," the three vowels pronounced separately. A variant of the latter is rendered "*trraüith*," and the notes of birds in large flocks about to settle are given as "*twi twi*" or "*twü twi.*"[2]

The call-notes of the whimbrel are rendered in Naumann as "*töü töü*" or "*töüi tröüi tlöüi*," and the alarm as "*gück gück.*" The courting song is described as a jodel with the call-note occasionally introduced.[3] In English the call of the whimbrel has been expressed as "*tetty-yetty-yetty-tetty-yetty-tetty-tet*" by Col. Feilden,[4] and Mr. Boyes in the *Field* renders it "*chitty, chitty, chitty, chitty, chitty, chitty, chitty.*"[5] The "*chitty*" or "*tetty*" is generally repeated seven times, from which the species in some districts is known as the "seven whistler." The same note, or a modification of it, uttered as an alarm-whistle in autumn, and also when the birds are flying high overhead on migration, is expressed by Professor Patten "*whee, whee, whee, whee, whee, whee, whee, whit.*"[6] The whimbrel indulges in a spring soaring flight and a trilling song. The latter is said to be similar to but softer than that of the curlew.[7]

The curlew usually nests high up on the hills, and although the nest is frequently among heather, this is due rather to the fact that heather abounds on the curlew's breeding-grounds than to any predilection of the species for that plant. In fact, in many localities

[1] *Nature in Eastern Norfolk*, p. 241.
[2] *Vögel Mitteleuropas*, ix. p. 146.
[3] *Ibid.*, ix. p. 155.
[4] Feilden, *Zoologist*, 1866, p. 3248.
[5] *Field*, 1889, vol. lxxiv. p. 476.
[6] *Aquatic Birds*, p. 368.
[7] Evans and Buckley, *Fauna of the Shetlands*, p. 176.

the majority of the nests are on the side or in the bottom of a slight hollow where there is more coarse grass than heather, and where the ground is distinctly boggy. Not infrequently the nest is made on perfectly bare ground, or where the grass is short, and occasionally a pair of birds may be found nesting in an enclosed field of coarse grass, and I have known of nests on ploughed land. But the curlew is more at home on the open hills.

Even when the nest is among heather or long grass there is little or no attempt at concealment. It is very large, somewhat untidy, and usually made of dry grass or sprigs of heather. Probably owing to the large size of the nest and eggs, it is more conspicuous than that of most Waders. The nest is, however, by no means easy to find, as the curlew is exceedingly wary, and the open nature of the country enables the sitting bird—or its mate, who generally keeps watch—to detect an intruder at a great distance. By carefully approaching a likely hollow under cover of a ridge, and suddenly revealing oneself, it is possible to take a curlew by surprise, and cause her to fly straight up from her eggs. Although it may be a considerable distance off, it is then not difficult to mark the place and find the nest. I have found one in this way when the bird rose a quarter of a mile away. It is only possible to do this when one is well acquainted with the country, and it is quite useless—considering the vast amount of the ground there is to cover—to look for a nest except where a bird has been seen to rise. Should the curlew suspect danger, she will stealthily leave her nest while the intruder is half a mile away.

Mr. Seton Gordon states that the curlew *always* flies right off the nest,[1] but Mr. Owen tells me (*in. litt.*) that, unless surprised, the bird runs stealthily for some distance before taking flight. In the evening when dusk approaches, the curlew is more likely to sit tight, and, providing the position of a nest is known, it is then often possible to walk right up to it before the bird leaves. Mr. Owen adds that he has known but one bird that sat tight in the daytime. She almost

[1] *Birds by Loch and Mountain*, p. 79.

allowed herself to be touched before she left, and when visited on several subsequent occasions always behaved in the same way. There have been many similar cases recorded; some birds have remained long enough to enable photographs to be taken, and one was even caught on the nest.[1] Mr. F. Fenwick, in a communication to the *Field*, stated that a curlew nested on a piece of moss-land, near his house, several years in succession. The bird was easily recognised, as she had a permanent gap in one wing, for which reason she was known to the family as "clip-wing." She was so tame that she allowed Mr. Fenwick's sons to smooth her and lift her from the nest. That the male assisted in incubation was made plain by the observation that "sometimes clip-wing was seen flying about while her mate was sitting."[2]

Dr. Heatherley tells me (*in litt.*) that whilst photographing curlews he has found the male bolder than the female; while the latter picks her way cautiously to the nest, the male comes on with a rush. He adds that the boldness of the male is shown also by his trusting to escape observation on the nest rather than take flight. Dr. Heatherley succeeded in photographing one before it left, and he says the only photographs of curlews he has seen obtained in this way—*i.e.* by openly stalking a tight-sitting bird—have been of males. Evidence, however, shows that the habit is by no means restricted to the male, and I doubt whether it is possible to tell with certainty the sex of a curlew in a photograph.

Both before and after the eggs are laid the birds may be seen walking about sedately near their nesting-site, and generally some distance apart. They frequently call to each other, the note being loud, and a modification of that part of the spring song that I have rendered "*gur-lech.*" Full clutches of eggs may be found in most localities in the middle of May, laying beginning, as a rule, in the end of April, sometimes as early as the 20th. The eggs are not laid on

[1] *Birds by Loch and Mountain*, p. 81; *Field*, 1904, vol. ciii. pp. 952, 1000; *Ibid.*, 1897, vol. lxxxix. p. 721.

[2] *Field*, 1900, vol. xcv. p. 734.

Curlew chasing a raven from its breeding-place

By A. W. Seaby

successive days; three or four days may elapse between the laying of each, and frequently a clutch is not completed in less than ten or twelve days.

Incubation takes about a month. As a rule the young do not leave the nest immediately they are hatched. If not actually in the nest they are sure to be very near it.[1] Dr. Heatherley says they remain in the nest for about sixty hours, which may be quite correct in some cases but is certainly not in all. In appearance the chicks closely resemble those of some of the genus *Totanus*. The bill is short and straight, and shows no sign of the curve or the length to which it will attain in a few weeks' time. Like the young of other Waders, they scatter and crouch flat on the ground when danger threatens, and are then very difficult to find. The parents now become very bold and aggressive if their breeding-grounds are invaded, and are prompt to attack other species. (Pl. XLIII.) They fly angrily overhead, flap their wings vigorously, and continually utter a loud alarm-note "*guck-guck guck-guck.*"

The whimbrel also is very bold and pugnacious at nesting time; it furiously attacks and drives away other birds that trespass on its breeding-grounds. It has been seen fearlessly to attack the Arctic skua,[2] the raven,[3] and even the Iceland falcon,[4] and Colonel Feilden stated that on the Færoes they were constantly chasing lesser black-backed-gulls. In these encounters the whimbrel's flight was observed to be rapid and arrow-like.[5]

I can find no record of either species "feigning injury" when the young are hatched, but the curlew does so occasionally when suddenly flushed from eggs.[6]

In those parts of the British Isles where both species breed, the whimbrel begins nesting operations a week or two later than the curlew. Colonel Feilden found them in the Færoes feeding in

[1] See also *Bird-life of the Borders*, p. 30.
[2] Yarrell, *British Birds*, iii. p. 508.
[3] Slater, *British Birds, their Nests and Eggs*, v. p. 176.
[4] *Aquatic Birds*, p. 369.
[5] *Zoologist*, 1866, p. 3248.
[6] Mr. Owen R. Owen (*in. litt.*).

the meadows, in flocks but paired, in the middle of May. They separated and betook themselves to the breeding-grounds soon after the 16th, and the first nest with eggs was found on the 25th of May.[1] The whimbrel closely resembles the curlew in its nesting-habits. The male generally stands on guard near the nest, and the female, when warned of danger, slips stealthily from the nest, but does not run far before taking wing. But like the curlew she may occasionally sit close, for Mr. T. E. Buckley, describing a pair of whimbrel observed on Hascosay in the Shetlands on June 9, 1890, stated that the female was a close sitter. Both birds were noisy at the nest.[2] In this respect it differs from the curlew, which species is quiet until the young are hatched. Messrs. Harvie-Brown and Buckley found the whimbrel tamer at the nest than the curlew. The old birds, with their heads lowered and held on a level with their bodies, ran within a few yards of them, repeatedly uttering the regular "whimbrel note."[3]

The young of both species are, when strong enough, conducted to the nearest marshes and later to the coast. The whimbrel is very partial to marshy pastures near the sea, and is always considerably less of a marine feeder than the curlew. Both species probe in the soft mud and sand. Although much of their food is obtained in this way, for which their long sensitive bills are specially adapted, yet they can readily pick insects and other small creatures from the surface of the ground and from water.

All Waders that frequent the seashore seem to know instinctively when the tide is on the ebb. They may be preening their feathers, or standing lazily on one leg on their accustomed resting-places, but when the ebb begins to lay bare the sand and mud they grow restless. At first two or three fly up followed by others, until all are up and on their way to the water's-edge. In none is this instinct more highly developed than in the curlew. It lingers longer

[1] *Zoologist*, 1866, p. 3248.
[2] *Fauna of Shetland*, p. 176.
[3] *Fauna of Orkney*, p. 224.

on the mussel-beds and mud-banks at the flow of the tide than almost any of its congeners, and then, instead of retiring to rest on an eminence near the shore, generally betakes itself inland to rest, and to feed on the cultivated fields and marshes. Yet when the tide turns, although the birds are out of sight and hearing of the sea, they will rise calling noisily, and pour down upon the shore first among the crowds of Waders to realise that feeding time is at hand.

Sir Ralph Payne-Gallwey, in that excellent book *The Fowler in Ireland*, says: "They will arrive just as the ooze is sufficiently uncovered to enable them to get their food by wading. I have watched them several miles from the tide cease feeding, call to one another, collect, and then point for the sea; and this, too, at the very moment I knew the shallows must be nearly exposed. Spring tides they will hit off exactly, never late, always on the spot just as the banks begin to show."[1]

They scatter in twos and threes when feeding, and at night constantly call to each other. Professor Patten thinks they see but feebly in the dusk and dark, as he has had many settle close around him apparently unaware of his presence.[2] Sir Ralph Payne-Gallwey thought they relied largely on their sense of smell. He states that when he was within thirty paces of them at night, behind a hedge or bank, 'an experimental cough or whistle, not unreasonably loud, did not alarm them, and the crack of a match was also disregarded, but the first whiff of tobacco and they were off in dire confusion."[3]

Both curlew and whimbrel occasionally perch on trees and rails, swim well when necessary, and are very fond of bathing. Stevenson stated that, so far as he could ascertain, the curlew never strikes lighthouses,[4] but Sir Ralph Payne-Gallwey includes it in some lists of species often killed against various lighthouses in Ireland,[5] and Mr. Cordeaux stated that there is no shore bird which so frequently

[1] *The Fowler in Ireland*, p. 232.
[2] *Aquatic Birds*, p. 361.
[3] *The Fowler in Ireland*, p. 236.
[4] *Birds of Norfolk*, ii. p. 195.
[5] *The Fowler in Ireland*, pp. 282-4.

strikes against lighthouses and lightships as the curlew.[1] Mr. Harting gives an instance of one that dashed through one of the tower lights at the Turnberry Lighthouse on the Ayrshire coast, smashing plate-glass a quarter of an inch thick, during a storm in 1893.[2]

It only remains to refer briefly to the superstitious dread in which the curlew is held in the remote Highlands of Scotland. This may have arisen partly from the eerie effect of its wild night cries, but certainly coupled with the goblin-like aspect of its long bill. The familiar name whaap or whaup, by which the curlew is known in the Highlands, is the name applied to a long-beaked goblin who is supposed to lurk beneath the eaves of houses after dark. With this and other long-nosed creatures of fancy the curlew is included in the Highlander's prayer to be saved "from witches, warlocks, and a' lang-nebbed things." Saxby tells us that the Shetlanders regard with horror the idea of eating so uncanny a bird, and relates that a visitor who was known to have eaten a curlew was frequently referred to in awesome whispers as "the man that ate the whaup."

[1] Yarrell, *British Birds*, iii. p. 501.

[2] *Handbook of British Birds*, p. 205.

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